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DIESEL RAILWAY TRACTION

A Supplement illustrating and describing developments in Diesel Railway Traction is presented with each copy of this week's issue.

A Suggestion Prosperity (sic) in this country reached to the F.B.I. an apex in 1929, after which began a slump, accelerated by the financial crisis of 1931, until the depths were plumbed last year. Now, as the results just published by the main line railways show, we are on the up-grade once more, though according to a recent estimate of *The Economist* we shall not at our present rate regain the 1929 level of business until 1939. But the Federation of British Industries, in a report to the Government published last week, suggests that even so mild an estimate is likely to be falsified unless certain specified measures are immediately taken. The F.B.I. desires above all the effective protection of the home market and the furtherance of the export trade—which implies achieving an excess of exports over imports, or a "favourable balance of trade." So does every other country, yet no single country is intelligent enough, or honest enough, to admit that the consummation of its desire can be only at the expense of other countries. A bitter economic war is raging with casualties as heavy as those of any military war, of a different kind perhaps, but entailing hardship and suffering no less pitiful. What is the use of talking about "unfair competition," as this latest F.B.I. report does, in the midst of a life and death struggle which may at any moment develop into a military war? We do not want to be beaten in this war, but

we do not want a victory like that which gave birth to the years since 1918. If the F.B.I. would slightly alter its objectives so as to place first the effective *expansion* of the home market, at present potentially enormous but frozen, some hard thinking might be necessary but the reward might be worth it.

Alternative to the 40-Hour Week

A meeting between the Engineering and Allied Employers' National Federation and various trade unions was held in London on February 15, and a statement of the trade union case has now been issued. Recognising that reward for labour is the chief source of purchasing power, which is insufficient to buy all the goods on the market, it points to the increasing shortage of employment as industry becomes more and more mechanised. The logical conclusion is drawn that increased production coupled with savings in labour should give mankind more leisure, but to achieve this it is proposed that no one shall be allowed to work more than 40 hours a week, for which he is to be paid by his employer no less than he gets now. How this could be done without increasing costs is not explained. If the 40-hours-a-week workers were to produce as much as they now do in 48, they would have more spare time and costs would not be increased, but the unemployment problem would remain untouched. Rather than return a merely negative reply to the trade unions, the employers would do well to follow the argument ably put by the former up to the 40-hour week suggestion, and then branch off on a new line, beginning with a careful analysis of all industrial costs. This would probably reveal that total disbursements by industry as a whole were chronically greater than the total of wages, salaries and dividends, which are the only sources of purchasing power. If that did indeed prove by such an analysis to be so, a new avenue of approach would be opened up to the solution of the paradox of starvation in the midst of plenty.

The Week's Traffic

In no instance does any item of traffic of the four group companies for the past week record any decrease though Great Western passenger train takings show no change. Merchandise earnings are again the principal feature in the improvement for the week, and the four companies together have an aggregate increase of £937,000 for the first seven weeks of the year in this class of traffic. The respective advances in aggregate merchandise receipts are now:—L.M.S.R. £389,000, L.N.E.R. £366,000, Great Western £151,000 and Southern £31,000. In passenger train earnings the L.M.S.R. has an increase for the seven weeks of £64,000, the corresponding gains by other companies being Southern £35,000, L.N.E.R. £14,000, and Great Western £1,000. Aggregate coal class traffic increases amount to £109,000 on the L.N.E.R., £29,000 on the L.M.S.R., £6,000 on the Great Western, and £5,000 on the Southern.

	7th Week						
	Pass	&c.	Goods, &c.	Coal, &c.	Total.	Year to date	Inc. or dec. %
G.W.R.	19,000	5,000	24,000	158,000	5.47
L.M.S.R.	..	9,000	40,000	11,000	60,000	482,000	6.93
L.N.E.R.	..	3,000	55,000	19,000	77,000	489,000	9.59
S.R.	..	5,000	2,000	2,000	9,000	71,000	3.24

The L.N.E.R. Last Friday the London & North Eastern Railway dividend announcement

was made of 2 per cent. on the 4 per cent. first preference stock and of 2½ per cent. on the 5 per cent. redeemable preference stock (1955), which rank *pari passu*. In some quarters 2½ per cent. was expected on the first preference, and this caused at first some depression

in prices, which, however, soon rallied. The 2 per cent. dividend on the £48,222,669 of first preference stock requires £964,453 and the 2½ per cent. on the £4,014,000 of redeemable stock takes £100,350. To enable these payments to be made the sum of £50,000 is proposed to be taken from reserve, but the carry forward is to be increased by £25,066, so that the net draft on reserves is really just below £25,000. For the year 1932 the corresponding dividends were 1 per cent. and 1½ per cent. respectively, and the same amount was taken from reserve, but the carry forward was increased by £1,510 only. Gross receipts of the railway for the whole year 1933 were actually £38,945 larger, as against the estimated increase of £3,000 shown in the traffic returns. At the end of the first six months of the year the returns registered a decrease of £981,000 in railway traffic receipts, so that the improvement in this respect for the second half of the year was probably well over £1,000,000.

Railway Salesmanship

In his lecture to the students of the Institute of Transport on "The Application of Modern Commercial Practice to Railways," which we summarise on another page, Mr. Ashton Davies, Chief Commercial Manager, L.M.S.R., claimed, with justice, that since the railways had been "pitch-forked" into the arena of fierce transport competition, they had achieved a revolution in the conduct of their commercial affairs. So far as the department over which Mr. Ashton Davies himself presides is concerned, his masterly exposition of the principles and practice which had been evolved on the L.M.S. system was certainly a splendid vindication of the railways' adaptability to modern commercial conditions. In the sphere of advertising indeed Mr. Davies claimed that the railways were definitely ahead of current commercial practice. In this connection we may draw attention to some recent examples of publicity, which we also reproduce in this issue, especially the advertisement in which Mr. Davies seeks, by stressing the personal note in contact with traders and public, to overcome the common impression of a huge impersonal organisation. This we think is all to the good, and we cordially agree with his contention that publicity pays only when the goods offered are acceptable and up to standard. There was a great deal of sound sense in Mr. Davies' lucid analysis of the commercial functions of railways under present conditions, which we hope will be read and pondered.

The Railway Bogie Again

In the third of a series of public advertisements the British Road Federation envisages a state of affairs in which "some towns will be virtually besieged through being encircled by a ring of weak bridges, and to get to many others it will be necessary for vehicles to follow circuitous routes to avoid the forbidden approaches." This is forecast to come into being as soon as Section 30 of the Road and Rail Traffic Act is operative, which empowers bridge authorities to prohibit or restrict the passage of vehicles over weak bridges. The railway companies, as bridge owners, are stated to propose to use their "new" powers to the full with the insidious intention of destroying road transport. Apart from the fact that such a course is far from the declared intention of the railway companies, it must be borne in mind that any restrictions imposed affect all vehicles alike, including those of the bridge authority. Not only are railways financially interested in road transport to the extent of many millions of pounds; they are also dependent on the roads for feeding their stations and depots. Moreover, as we pointed out as recently as January 19, the bridge restrictions are not new, but are

largely a consolidation in more workable form of long-standing legislation vitally necessary to public safety, with the great improvement of providing effective power of review by the Minister of Transport.

"Grade Separation" in U.S.A.

To British travellers by the Twentieth Century Limited, and other well-known trains using the New York Central main line between New York and Buffalo, the contrast between hurrying for many hundreds of miles at an average speed of more than a mile-a-minute, and the leisurely progress for a mile up the centre of the main street of Syracuse, N.Y., to the "depot" in that city, must be singular indeed. To the accompaniment of a dismal and incessant tolling of the locomotive bell, warning street traffic to keep clear, the passenger looks through the car window at shops on both sides of the street, what time this curious course—illustrated on page 300 of this issue—is covered at a speed of 15 m.p.h. But it will not be possible to enjoy this experience for much longer. Contracts have now been placed for the elevation above street level of the New York Central tracks in Syracuse, at an estimated cost of \$7,500,000. This is but one of many projects now in course of realisation throughout the United States, and in the Eastern States in particular, of "grade separation"—that is, the abolition of level crossings by conversion to overline or underline transits of existing crossings of streets across railways, or even of railways across railways, which at present are indefensibly numerous in the U.S.A.

South African Developments

Train service developments of considerable importance have been taking place in South Africa during the present winter. As showing how little the standard gauge of 3 ft. 6 in. is permitted to restrict the capacity of rolling stock, the new twin dining car sets, described on page 693 of our issue of November 10 last, have been built to an extreme width of 9 ft. 3 in., and each body is 63 ft. long. Speed must of necessity be more limited on the narrower gauge, but in this respect also advances have been made. The time of the Union Limited express, which carries only first-class passengers, over the 956 miles between Capetown and Johannesburg has been brought down to 28½ hr., while the best ordinary service has been accelerated from 36½ hr. to 30 hr. 38 min. and similarly in other directions. On page 295 of this issue still more notable developments are forecast, including a £10,000,000 scheme, spread over 10 years, to make the main lines suitable for still higher speeds. A time of 20 hr. between Capetown and Johannesburg is even mentioned.

Railways and the Air

Over four years ago the British main line railways obtained powers to operate air services. Now it is announced that an agreement has been made between the four companies and Imperial Airways Limited for the formation of a new company, with a nominal capital of £50,000, to operate air services in the British Isles and elsewhere and to form connecting links with the existing services of Imperial Airways. It is probable that the company will be a private one, all the shares of which will be held by the main line railways and Imperial Airways Limited. During the last year or two numerous independent air services have sprung into being and, although it is unlikely that they have as a rule proved paying propositions, they have carried an increasing traffic. It is almost certain that more and more travellers, especially those pressed for time, will in future travel by air, and that air services will—provided they are rationalised—reap the benefit of

the enterprise of the pioneers. But it may be hoped that air traffic will be an addition to travelling in general rather than a diversion from the railways. There are disadvantages from which aircraft suffer—particularly in regard to terminal facilities and interference by inclement weather—from which railways are free.

The First Locomotive in Germany

The article appearing on page 305 of this issue dealing with the centenary of the German railways makes it of interest to investigate the facts concerning the first locomotive placed in service there. At that stage in the history of railways it was usual for Continental countries, owing to lack of facilities of their own, to look to England for the supply of railway material of all kinds, and we have it on reliable authority that the first locomotive sent to Germany was built by Robert Stephenson & Co. in 1835 for the Nuremberg-Fürth Railway. It was named *Der Adler* and was of the single driving wheel type with the 2-2-2 wheel arrangement. Warren, in his valuable work "A Century of Locomotive Building," records that the railway company entered into correspondence with Robert Stephenson with a view to the supply of material for its lines, but that communications were eventually broken off "in consequence of his demands, which, owing to the great difference in the value of money in the two countries, seemed to the directors too high to be conceded in justice to their constituents." The order for the locomotive was, therefore, placed with a firm at Aalen, who guaranteed to deliver an engine "equal to the best English engine and not requiring more fuel." The contract for the delivery not, however, being fulfilled, the engine was eventually ordered from Robert Stephenson & Co., at a price calculated at equal to £1,750 on the line. It was a small edition of the *Patentee* built by Stephenson for the Liverpool & Manchester Railway, the respective weights being 11 tons 9 cwt. for the *Patentee* and 6 tons 12 cwt. for *Der Adler*. A photograph of the latter engine appears on page 304 of this issue.

Railcars

As an impartial resume of the progress so far made in the design and use of railcars, Mr. J. S. Tritton's paper, read on Thursday last before the Institution of Locomotive Engineers, and bearing the title of this note, is easily the best which has been delivered for some time, and it should be perused attentively by automobile engineers aspiring to build railcars, by locomotive engineers intending to co-operate, by traffic managers confronted with this new form of transport, and by all who are responsible for signalling. The railcar and its possibilities are looked at from all points of view, not forgetting the passengers, and there is no lopsided advocacy of the diesel-electric, steam or any other type of railcar to the complete exclusion of everything else. Comparisons are made between figures about which there can be little cause for dispute, e.g., weights, powers, overload capacities, transmission efficiencies, &c., while questions of cost, concerning which we know too little as yet to show a marked partiality, are wisely left undiscussed. The author does not make the rather too common mistake of supposing that the steam railcar has followed the dodo. On the contrary, he shows himself to be very much alive to the striking advances made by this form of unit.

Cutting Out Trailers and Signals

Two suggestions in Mr. Tritton's paper, referred to above, will excite prolonged discussion. One is the proposal to eliminate the trailer which is apt to turn the railcar into a train and lead back to increased headways and inflexibility in the matter of stopping places (besides

necessitating a heavier tractor unit uneconomical to operate by itself). The other is the proposal to run railcars on sight, i.e., without signalling. The visibility on a railway is much better than that on most roads, and this would give the longer stopping distances necessitated by the railcar in comparison with the omnibus, on account of the reduced friction between wheels and track. The author wisely points out that running on sight would be possible only on certain lines. He does not make the mistake of seeing a close resemblance between the main line signal of to-day and the red flag which had to go before the automobile at the beginning of the century. The greatest field for the railcar is on lines now little used and, as the author suggests, traffic development will be more likely to take place as the result of a frequent service of independent cars stopping wherever desired than where infrequent trailer outfits call at widely spaced stations.

Reducing the Cost of Crossing Welding

Progress during the last five or six years in the repairing of worn railway crossings by electric welding has been continuous, and all British railways now have a considerable number of portable welding plants in use for the purpose. An idea of the importance of this method of maintenance was given by Mr. George Ellson, Chief Engineer of the Southern Railway, in the discussion following Mr. R. J. M. Inglis' recent paper at the Institute of Transport, when he estimated that the annual saving per welding machine amounted to between £1,200 and £1,500 on the Southern Railway. That sum multiplied by the 30 or so plants in use on the Southern represents an amount which would go far in its contribution to the total of economies effected in recent years. All these plants are of the petrol-electric type and the process of welding was described in detail in THE RAILWAY GAZETTE of December 11, 1931. Probably petrol consumption represents something like 20 per cent. of the total cost of reconditioning a crossing by welding. Any appreciable reduction of this item that did not raise the percentage of another would be of some importance, and the use of a diesel engine for the motive power would of course effect a great reduction in fuel cost. A new dismantlable diesel plant is described on page 301.

A Rebuilt 4-4-2 Locomotive

Between the years 1911 and 1918 a number of three-cylinder Atlantic type express locomotives were placed in service on the then North Eastern Railway. They were of the single-expansion type with a separate Stephenson link motion valve gear for each cylinder, and the whole of the valve mechanism was located inside the frames. One such engine was equipped for working on the uniflow principle invented by Dr. Stumpf of Berlin. The engines as a class gave very good results in handling express passenger trains, many of them running in the East Coast Anglo-Scottish service. Mr. H. N. Gresley, the Chief Mechanical Engineer of the L.N.E.R., has recently rebuilt engine No. 732, belonging to this series with new cylinders having poppet valves actuated by R.C. (rotary cam) gearing. The cylinders and gearing are identical and interchangeable with those of the L.N.E.R. "Shire" class 4-4-0 type locomotives, the arrangement being that the valve motion for the inside cylinder is now the only one between the frames. The running board has been raised to a height of 5 ft. 9 in. from rail level to its underside, the connecting and side rod bearings are thus rendered accessible in all positions, including the top centre. The engine in its altered condition is illustrated on page 299.

Great Western Railway

AFTER the exceptional economies effected during the second half of 1932 and during the first half of 1933 it was not to be expected that the savings during the second half of 1933 would be on anything like the same scale as in the previous year. Nevertheless, the accounts for the year 1933 again make a most satisfactory showing, indicating as they do that substantial economies have again been effected, while the balance sheet reveals a thoroughly sound financial position which justifies the continuance of the bold dividend policy decided upon a year ago. The apparent increase in the deficiency in 1933 was entirely due to a smaller amount being utilised in aid of dividends from profits on realisation of investments, and the nominally large draft on the contingency fund, has, owing to accruals to that fund from other sources, been reduced in effect to £496,000. With the report is issued a summary of financial accounts and returns for the past year. Gross receipts from the railway were £24,572,250, an increase of £59,299 or 0·24 per cent., and in the railway expenditure of £20,102,245 there was a reduction of £388,899 or 1·90 per cent., thus bringing the operating ratio down from 83·59 per cent. to 81·81 per cent. Net railway receipts were accordingly £4,470,005, an improvement of £448,198. On ancillary businesses as a whole there was a net loss of £17,092 as compared with a profit of £7,755 in 1932. This was due mainly to reductions of £78,942 in dock net receipts and of £11,496 in steamboat profits.

	1933.	1932.	1931.
	£	£	£
Total expenditure on capital account ..	182,504,569	181,084,289	179,423,866
Gross receipts from businesses carried on by the company ..	28,423,656	28,462,343	31,139,630
Revenue expenditure on ditto ..	23,970,743	24,430,291	26,052,984
Net receipts of ditto ..	4,452,913	4,032,052	5,086,646
"J" Joint Lines—company's proportion of net revenue ..	131,779	127,661	140,941
Miscellaneous receipts (net)	985,331	1,024,686	1,162,541
Miscellaneous charges ..	741,462	724,996	707,732
Net revenue ..	4,828,561	4,459,403	5,682,396
Profit on realisation of investments ..	71,529	605,927	—
Interest on loans and debenture stocks ..	1,619,809	1,549,804	1,549,789
Dividends on rent charge, guaranteed and preference stocks ..	3,344,699	3,347,118	3,347,638
Balance after payment of preference dividends ..	Dr. 64,418	168,408	784,969
Dividend on ordinary stock ..	1,287,892	1,287,892	1,287,892
Rate per cent. ..	3	3	3
Deficit ..	1,352,310	1,119,484	502,923
Appropriation from Contingency Fund ..	1,350,000	400,000	500,000
Transfer of General Reserve Fund ..	—	700,000	—
Balance brought forward from previous year ..	42,989	62,473	65,396
Balance carried forward to subsequent year ..	40,679	42,989	62,473

Previous losses on canals and on collection and delivery were, however, reduced by £4,564 and £41,788 respectively, and the net earnings of the hotels department improved by £20,005, and those of road transport by £3,270. Under road transport the receipts from goods services advanced from £44,240 to £63,124. There is an interesting new item of "air transport," with gross receipts of £1,664, but with a net loss of £6,526. It is noted in the report that during the summer months an

experimental air service was established by the company in conjunction with Imperial Airways Limited between Plymouth, Torquay and Cardiff and was subsequently extended to Birmingham.

Net revenue from J. Joint Lines improved by £4,117, but in miscellaneous receipts there was a net fall of £39,355. General interest receipts, at £304,223, were £117,648 lower, but Treasury grants under the Development Act, 1929, increased from £119,330 to £178,283, and dividends in road transport undertakings were £69,275 against £46,940, the improved position of the Western National Omnibus Co. Ltd., due to internal reorganisation, being responsible for £20,901 out of the increase of £22,335 in these dividends. Miscellaneous charges were £16,466 higher. Net revenue, at £4,828,561, comes out £369,158 higher and represents 2·85 per cent. on receipts from capital issued, as compared with 2·67 per cent. for 1932. Results for the past three years are compared in the table in the previous column.

While the number of ordinary passengers (including workmen) originating on the company's system rose by 68,600 or 0·07 per cent., receipts from ordinary passengers and workmen (£6,915,562) dropped £48,740 or 0·70 per cent. Of this net decrease £32,298 was in third class ordinary and £22,839 in first class ordinary, workmen's receipts having improved by £6,397. Against a fall of 15,353 in the number of ordinary first class originating passengers, there were rises of 33,688 in the number of ordinary third class originating passengers and of 50,265 in the number of workmen. Season tickets brought in £29,129, or 4·65 per cent., less, but in parcels, &c., there was an improvement of £28,821 or 0·98 per cent. Thus in passenger train receipts as a whole there was a decrease of £49,048. On the goods train side the advance was mainly in minerals and merchandise (Classes 1-6), receipts being higher by £240,899 or 13·88 per cent., with an increase in tonnage of 245,589 or 4·07 per cent. Higher class merchandise receipts (£6,589,953) improved by £3,821 or 0·06 per cent., though there was a drop in originating tonnage of 25,203 or 0·32 per cent. Receipts from coal, coke and patent fuel (£5,113,520) were, however, down £86,219 or 1·66 per cent., with a drop in originating tonnage of 399,400 tons or 1·16 per cent. Live stock receipts were down £49,877 or 19·32 per cent. Total goods train receipts therefore showed a net increase of £108,624. The accompanying table shows the approximate allocation of receipts in 1933:—

	Amount £	Amount per £ s. d.
Salaries and wages ..	16,000,000	11 3
Coal ..	1,750,000	1 3
Other material ..	3,200,000	2 3
Rates and sundry items, less miscellaneous receipts ..	2,650,000	1 10
	23,600,000	16 7
Appropriation from reserves, &c. ..	1,400,000	11
	22,200,000	15 8
Interest and dividends on capital ..	6,200,000	4 4
	28,400,000	20 0

In locomotive running expenses (£4,820,180) there was a saving of £121,311 and in traffic expenses (£6,967,538), a saving of £205,599, although train miles slightly increased. Reference is made in the report to the irreparable loss caused by the death of Viscount Churchill, who had been Chairman longer than any of his predecessors. The services which he rendered to the company and the whole railway industry were of inestimable value.

Southern Railway

FROM the report and accounts for 1933 even more encouragement may be derived than from the satisfactory dividend announcement. The increase of £173,276 in receipts from railway working was accompanied by a decrease of £203,054 in railway expenditure, and the net receipts (£477,859) from ancillary businesses showed an improvement of £149,728. The share of loss on the Somerset & Dorset Joint Line was reduced by £2,060, and miscellaneous receipts improved by £120,918, though there was an increase of £3,348 in miscellaneous charges. Net revenue for the year was £645,688 higher at £5,539,797. Against this an additional £190,000 had to be provided for interest on the £4,750,000 of 4 per cent. redeemable debenture stock ranking for interest from January 1, 1933. Though the increase of the dividend on the preferred ordinary stock from 1 per cent. to 3 per cent. requires £551,732 more, the carry forward is £17,754 greater. In passenger train traffic, which produced £321,007 more than in 1932, it is to be noted that first-class ordinary receipts were £42,494 lower, and first-class seasons brought in £22,142 less. Second-class ordinary receipts, on the other hand, were £19,993 higher, showing a definite increase in Continental travel. From third-class ordinary passengers and from season tickets there were increases of £274,538 and £58,712 respectively, and workmen's tickets brought in £29,171 more.

	1933.	1932.	1931.
Total expenditure on capital account...	164,336,509	163,139,152	160,771,595
Gross receipts from businesses carried on by the company	22,598,417	22,329,065	24,373,592
Revenue expenditure on ditto	18,092,686	18,349,392	19,761,665
Net receipts of ditto	4,505,731	3,979,673	4,611,927
"J" Joint Lines—company's proportion of net revenue	Dr. 45,706	Dr. 47,766	Dr. 28,380
Miscellaneous receipts (net)	1,302,368	1,181,450	1,235,438
Miscellaneous charges	222,596	219,248	211,111
Net revenue	5,539,797	4,894,109	5,607,874
Interest on loans and debenture stocks, &c.	1,943,167	1,753,167	1,753,167
Dividends on guaranteed and preference stocks	2,751,278	2,751,278	2,751,278
Balance after payment of preference dividends	845,352	389,664	1,103,429
Dividend on ordinary stocks	827,598	275,866	1,103,464
Rate per cent. :—			
Preferred ordinary	3	1	4
Deferred ordinary	—	—	—
Surplus or deficit (+ or -)	+ 17,754	+ 113,798	- 35
Balance brought forward from previous year	207,173	93,375	93,410
Balance carried forward to subsequent year	224,927	207,173	93,375

It may be taken for granted that electrification and summer tickets strongly influenced the third-class ordinary traffic, and that electrification further stimulated the revenue from third-class seasons. In parcels, mails, &c., the increase was only £3,229. Goods train receipts as a whole were £153,617 lower. Though minerals and merchandise (Classes 1-6) brought in £12,298 more, higher class merchandise brought in £93,093 less, and coal, &c., receipts were down £67,352. Under every heading of the ancillary businesses there was an improvement, the net receipts from steamboats being £65,503 up, docks £30,409 up, collection and delivery £48,123 up, road transport £1,016 up, and canals £500 up.

The Southern is the only one of the four groups to show a profit on canals and c. and d. On the other hand, it made a loss of £588 on the three hotels which

it works, viz., Deal (South Eastern), Charing Cross, and Craven, but the loss in 1933 was £4,177 smaller than in 1932. Among the miscellaneous receipts the company obtained £47,729 more in Treasury grants under the Development Act of 1929, and £65,274 more in general interest. The balance-sheet shows that investments in Government securities have increased from £6,503,614 to £8,601,958, indicating that a substantial portion of the new issue of debenture stock has been invested in this way. Investments in road transport undertakings have advanced from £1,390,802 to £1,813,636. The table in the preceding column compares financial results for the past three years.

Receipts from railway working amounted to £19,845,824 and railway expenditure to £15,817,952, the operating ratio being 79.70 per cent. in 1933, against 81.44 per cent. in 1932. In maintenance of way and works there was a net reduction of £20,733, but the expenditure figures include £285,189 transferred to renewal account. Maintenance of rolling stock cost £46,595 less. Locomotive running expenses show an advance of £6,804, but this is not to be wondered at considering that electric engine mileage increased by 4,328,941, though steam engine mileage decreased by 1,423,753. In traffic expenses there was the satisfactory saving of £154,015 following on a reduction of £337,440 in 1932. Capital expenditure during the year 1933 was £1,197,356, the principal items being electrification of lines £110,591, and Southampton docks £1,079,640. Of the Southampton works, schemes costing £939,252 are being assisted by Treasury grants. The report refers in some detail to the chief works completed, in hand, or contemplated, to most of which reference has already been made in THE RAILWAY GAZETTE. Carriage washing plants are being installed at Longhedge (Battersea) and at Clapham Junction. A large shed for storage of traders' goods carried by rail has recently been brought into use at Southampton. Water softening plants have been installed at the locomotive depots at Hither Green, Longhedge, and Ramsgate.

Great Northern Railway (Ireland)

CIRCUMSTANCES entirely beyond the control of the management were against this company in the first six months of the year 1933, and the rather better conditions in the second half of the year could not make up for earlier losses in spite of the large reductions made in expenditure to meet the altered position of the company and the gallant fight put up by the management and staff to regain traffic. During the first half of the year there was a deficiency in net income of £84,994, but in the second half there was a surplus of £50,310. The deficiency in the first six months was chiefly caused by the strike which began at midnight on January 31, 1933, and largely curtailed the company's services for a period of ten weeks. Fiscal restrictions affecting cross-border traffic were further increased during the year, with detrimental results to the company's carryings, and the competition of uneconomic road transport continued to have a serious effect on receipts. Altogether, the year was the most difficult in the history of the company, but the results of the working for the last half of the year, in all the circumstances, were not unsatisfactory. The Irish Free State legislation for the co-ordination of transport has already been of benefit to the company, and the directors are sanguine as to the results of representations jointly made by them and the boards of other railways to the Government of Northern Ireland. Good progress has been made with the re-organisation of the company's passenger road services, and, in consequence, the loss in working has been materially

reduced. The accompanying table compares the general financial position for the past three years:—

	1933 £	1932 £	1931 £
Total expenditure on capital account ..	10,052,929	10,052,929	10,052,929
Gross receipts from businesses ..	1,003,534	1,389,912	1,558,172
Revenue expenditure on businesses ..	1,075,469	1,360,954	1,378,958
Net receipts of businesses Dr.	71,935	28,958	179,214
Miscellaneous receipts, net ..	37,251	64,629	59,762
Total net income .. Dr.	34,684	93,587	238,976
Interest, rentals and other fixed charges ..	150,634	147,957	149,561
Dividend on preference stock ..	Nil	Nil	79,967
Dividend on ordinary stock ..	Nil	Nil	20,253
Rate per cent. ..	—	—	$\frac{1}{2}$
Proportion of compensation under Irish Railways (Settlement of Claims) Act, 1921 ..	—	38,429	10,000
Appropriation from general reserve ..	100,000	—	—
Balances released from miscellaneous accounts ..	46,982	—	—
Brought forward ..	38,336	54,277	55,082
Carried forward ..	—	38,336	54,277

Passenger train traffic brought in £409,036, a decrease of £160,435, and goods train receipts were £214,051 lower at £371,993. Total railway receipts amounted to £811,054, a decrease of £384,888. In the railway expenditure of £856,880 there was a reduction of £271,688, and the net loss on railway working amounted to £45,826. The loss on road transport was reduced from £38,625 to £27,828, and the net receipts from hotels, &c., improved from £209 to £1,719. Miscellaneous receipts (net) brought in £27,378 less, the main reasons being that receipts from general interest were £15,215 lower, and that in 1932 there was a special item of £10,386—profit on conversion of 5 per cent. war loan. The increase of £2,677 under interest, rentals, &c., was mainly because of the greater loss on working the County Donegal Joint Railways.

London & North Eastern Railway

WITH the full report and accounts for the year 1933 there is again issued a convenient summary of the results of working during the past twelve months, and a most interesting review of the company's business during the past year accompanies both documents. Following on the remarkable economies of £2,535,343 effected in railway expenditure in 1932 when railway receipts were £4,504,798 down in comparison with 1931, it is a matter of congratulation to the management that the increase of £38,945 in railway receipts in 1933 was accompanied by a decrease of as much as £456,382 in railway expenditure. Gross receipts from the railway in 1933 were £42,687,504 and expenditure amounted to £35,211,321, leaving net receipts of £7,476,183 which were £495,327 higher than in 1932. Amongst the ancillary businesses there was an improvement of £32,325 in the net receipts from docks, harbours and wharves which amounted to £95,314, and the profit of £85,681 shown by the hotels department was £21,332 greater than in 1932, while the loss on collection and delivery was reduced from £339,492 to £270,640. On the other hand, there was a loss of £95,314 on steamboats, which was £23,163 higher than in the previous year, and the net receipts of £14,822 from road transport were £353 down. From road passengers the company took £76,851 gross in 1933 against £78,192 in 1932, but its gross receipts from road goods services rose from £35,055 to £59,731. From J. Joint Lines the company's proportion of net revenue was £59,933 higher than in

1932. Miscellaneous receipts (net), however, dropped £91,984. General interest showed a debit of £76,515 as against a credit of £40,332 in 1932, and there was a fall in rents, but Treasury grants under the Development Act advanced from £47,642 to £80,013, and dividends from road transport undertakings were £167,646 as against £151,547 in 1932. The accompanying table compares results for the past three years:—

	1933 £	1932 £	1931 £
Total expenditure on capital account ..	350,076,791	349,349,642	348,295,511
Gross receipts from businesses carried on by the company ..	48,789,274	48,678,700	53,828,366
Revenue expenditure on ditto ..	41,496,163	41,979,163	44,989,556
Net receipts of ditto ..	7,293,111	6,699,537	8,838,810
"J" Joint Lines—company's proportion of net revenue ..	242,401	182,468	257,251
Miscellaneous receipts (net) ..	1,120,950	1,212,934	1,249,839
Miscellaneous charges ..	933,342	928,081	921,290
Net revenue ..	7,723,120	7,166,858	9,424,610
Interest on loans and debenture stocks, &c. ..	4,255,105	4,255,105	4,255,105
Dividends on guaranteed and preference stocks ..	3,492,949	2,960,543	5,219,185
Balance after payment of preference dividends .. Dr.	24,934	Dr. 48,790	Dr. 49,680
Dividend on ordinary stock ..	Nil	Nil	Nil
Rate per cent. :—			
Preferred ordinary ..	Nil	Nil	Nil
Deficit ..	24,934	48,790	49,680
Appropriation from reserve ..	50,000	50,000	—
Balance brought forward from previous year ..	31,577	30,367	80,047
Balance carried forward to subsequent year ..	56,643	31,577	30,367

In the passenger train earnings of £15,770,770 there was a net decrease of £23,167. Ordinary passengers brought in £9,118,645, a net increase of £84,696, decreases of £33,843 and £3,352 in first and second class, respectively, being offset by an increase of £121,891 in third class. Season tickets were down £109,315 and workmen's tickets were £9,351 up, but in parcels, mails, etc., there was a net decrease of £7,899. In the review of the year's business there is interesting information as to the effect of penny-a-mile fares. For the 17 weeks ending on April 29 passenger journeys (exclusive of season tickets) numbered 913,000 fewer than at the corresponding date of 1932, with receipts £77,000 lower. During the next two months when the penny-a-mile fare was in operation the passenger journeys increased by 664,000, but receipts showed a further decrease of £23,000. Thereafter a definite improvement began to set in, doubtless assisted by a wonderfully fine summer. Between the date on which the penny-a-mile fare was introduced and the end of the year passenger journeys increased by nearly five and three quarter millions and passenger receipts (exclusive of season tickets) by £144,000 at a cost of a little over a million engine miles. The review adds:—"While to declare that the evidence available is conclusive as to the value of the penny-a-mile fare would be premature, it has at any rate been such as to have justified the companies in deciding to maintain this fare throughout the current year."

The net improvement of £122,237 in goods train traffic receipts was entirely in merchandise and minerals (Classes 1-6), which, with an increase of 1,986,449 in tonnage, brought in £486,448 more, the total receipts in these classes being £3,946,736. Higher class merchandise receipts were £11,087,835, a decrease of £114,984, the corresponding tonnage being 98,321 less, at 18,830,751. Though the tonnage of coal, coke and patent fuel was 53,320 higher, receipts therefrom were £249,127 lower.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of Correspondents)

The Signal Engineers' Department

London,
February 14

TO THE EDITOR OF THE RAILWAY GAZETTE.

SIR,—Noting the letters which have appeared in recent issues of your paper concerning the signal engineers' department, I am impressed by the fact that the writers stress the signal engineers' contribution to the safety of railways. Is this sufficient? Should not the safety of modern signalling be taken for granted. Perhaps if some signal engineers who are worrying about their not being appreciated concentrated more on the acceleration of traffic and economies to be effected by well planned signal schemes, their managements would appreciate their worth.

Yours,
"ECONOMY"

The Royal Scot Abroad

"Coll-Earn,"
Auchterarder.
February 20

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—"Mother of Six's" letter reminds that there are summits and summits—real, railway and artificial. She says that propaganda has raised Shap summit (rail) by 85 feet and the C.P.R. summit by 274 feet, but Fitter W. Woods, who was on this train on tour, has (according to press report) raised it no less than 674 feet to 6,000.

But, as he says at the same time that, "We were limited to a speed of 45 miles an hour because the tracks are laid so badly in the United States. There are no chairs and bolts as on British lines but just a couple of long nails knocked into each sleeper on either side of the rail; little wonder that once when we were doing nearly 75 m.p.h. an official shoved a red flag out of a window and shouted to us to pull up," we may disbelieve Fitter Woods, of Crewe, on summits.

But the summit of Ben Lawers has gone up 18 feet to a proud 4,003, thanks to the labours of the people of Killin, who have succeeded in stone-rolling where the great Sisyphus failed. So now travellers on the Oban line can say, "Over 4,000 feet, you know," and itch to climb.

All this patriotic, but erroneous, boasting has stirred others to comic tales. A Mr. Norman Tiptaft (in the *Sunday Post* of Glasgow) adds to it, in a long article on his railway discoveries all over the globe, things like this: "The French railways permanent way is not as smooth and easy riding as the British. Their trains are no faster. Britain has held the record for speed for many years." Then, under a big, black sub-heading, "THE WORLD'S FASTEST TRAIN," we are startled thus: "The Fastest Train in the world takes you from New York City to Los Angeles, Cal., at an average speed of 85 miles an hour. These new trains have adopted [sic] all sorts of speed devices from the motor-car industry. They are built of duralumin and the difference is enormous. They have a much lower centre of gravity than the ordinary ones, the bottoms of the coaches being only 9½ inches above the track." Also he tells us that special brakes pull up his seraphic-like flyer in 1,300 feet "at this enormous speed"—speed not given.

"Mother of Six" is right. Mr. H. N. Gresley went over the Rockies with 950 tons of cars one way and then back with 1,050 tons, climbing 35 miles at 1 in 45, in each case with one engine. The Royal Scot train weighed 268 tons.

Surely the summit of flap-doodle was reached when an official who went through Canada and the U.S.A. with the Royal Scot was delivered of this—according to press report—"They don't build engines over there. They make rough casts, stick them together, paint them a certain colour, and trust to luck." Now we know why their locomotives at the end of a run of 850 miles at high speed, and hauling 1,200

tons of cars, just collapse and relapse to the useful scrap whence they came.

It seems a pity that a great enterprise well carried out should be spoilt by sneering—quite unjustifiably—at our friends over the water.

Yours truly,
NORMAN D. MACDONALD

Estimating Bridge Weights

Calle Guanahani 322,
Buenos Aires.
November 18

TO THE EDITOR OF THE RAILWAY GAZETTE.

SIR,—I know of no formula which gives approximately the weight of the main girders of a bridge. All the formulæ which I have seen are not rational. I have calculated a formula which gives the weight of the main girders to a close degree of approximation; and the same formula, with a different value for the coefficient C, gives the weight of the whole of the metal part of the bridge. It is thus very useful for preliminary estimates. The formula is:—

$$P = \frac{Mf \times C \times L}{H \times R}$$

where P = weight of the two girders, in long tons (of 2,240 lb.)

Mf = bending moment, in tons and feet, of the maximum load and of impact and also of the flooring consisting of ties, longitudinals and track.

L = length of bridge, in feet, from centre to centre of supports.

H = height from centre to centre of gravity of the girder flanges, in feet.

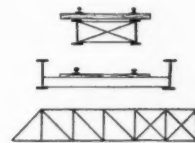
R = stress, in tons per sq. in.

C = a numerical coefficient.

= 0.0065 for deck bridge, No. 1.

= 0.0075 for No. 2.

= 0.0095 for No. 3.



For the calculation of the total weight of the whole of the metalwork of the bridge, girders, cross ties, longitudinals and wind bracings, a similar formula may be used for a preliminary estimate, but, instead of the coefficient C, the coefficient C' is substituted, the values of which are as follows:—

C' = 0.0073 for deck bridge No. 1.

C' = 0.01 for No. 2.

C' = 0.012 for No. 3.

In this latter formula, Mf = bending moment refers only to the rolling load and impact.

With compliments,

FRANÇOIS MASSILLON

[The formulæ given by M. Massillon are essentially for single-track bridges with non-ballasted and non-concreted floors, and need the following slight modification for application to British practice:—

(1) For the weight of the girders, the whole of the floor dead load should be included in the term Mf.

(2) For the weight of all steelwork in a single track bridge, the same remark applies.

(3) For double-track bridges with non-ballasted and non-concreted floors, the term C' should be modified to 0.012 for type 2, and to 0.014 for type 3.

(4) For concreted and/or ballasted double-track bridges, the weight of the concrete and ballast should be added to the rolling load and impact load, and the modified values of C' given in (3) above used.

We consider M. Massillon's formulæ and our suggested modifications may be found of considerable use for purposes of estimation.—ED. R.G.]

PUBLICATIONS RECEIVED

Romance of the Baghdad Railway.

By Rev. J. T. Parfit, M.A. London: Pictorial Lectures and Film Lantern Slides, 16, Marsham Street, S.W.1. 67 pages. 7½ in. × 5 in. Price 2s. 0d. net.—The Rev. J. T. Parfit, M.A., who was formerly Canon of Jerusalem, has issued in this little book the substance of two lectures included in his series. The first, which bears the same title as the book, is an account of the origin and construction of the famous line which was undertaken by German engineers to extend the Anatolian Railway through to Baghdad and the Persian Gulf. The political aspect is treated very fully from the viewpoint of one holding an official position in Baghdad, and it makes fascinating reading if one is prepared to dilute the strong phrases which accuse this railway of being the cause of the world war and therefore "the Railroad of Death" which "cost the nations three million lives and twenty million casualties; a price which must never be paid again for any steel track or any historic highway." Important to the late war as was the Baghdad Railway, it is a pity that the story told here should suffer from such extreme over-emphasis. The book also includes the text of another lantern lecture entitled "The Gates of the Orient." Various halftone illustrations are reproduced of subjects which this lecturer shows on slides.

Engineering Workshop Principles and Practice. By Arthur G. Robson, A.M.I.Mech.E. London: Emmott & Co. Ltd., 28, Bedford Street, W.C.2. 8½ in. × 5½ in. × ½ in. Pp. 304. Illustrated. Price 7s. 6d. net.—This is the fourth edition of a work first published in November, 1914. In the preface to the first edition the author stated that, as a teacher of engineering subjects under the L.C.C., with some knowledge of the requirements of engineering students and apprentices, he had compiled the volume to supply what he felt was a distinct want in this direction. No effort was spared to set forth the matter in plain language, while numerous practical illustrations were introduced to make the context clear. In the present edition, additional matter has been introduced, more particularly in connection with the chapter on Gauges for Fine Measurements; and another interesting portion, which has been added under the heading of Gauge Making, deals with screw gauges. The book is divided into 32 chapters covering a wide variety of subjects connected with engineering shop practice; commencing with a survey of the simpler forms of tools such as chisels, files, stocks and dies and so forth, it also covers lathe work, drilling, automatic machine tools and processes, shaping, grinding and numerous other types of machines, reamers and gauges. There

is a chapter on the manufacture of crankshafts, valve-box details and other engine and machinery details; and chapters on the heat treatment of steels and the manufacture and properties of metals. The concluding chapter comprises a series of adaptable exercises for students. While being of a general engineering character, the work should prove of inestimable value to railway shop apprentices and, indeed, to those more experienced in the various tasks involved in a works where locomotives and railway carriages and wagons are built and repaired. It should also prove highly useful in engineering classes, as it provides a ready reply in well-understood language to the majority of questions which are likely to arise.

Die Berliner Stadtbahn-Lokomotiven im Bild (The Steam Locomotives of the Berlin City Railway Illustrated), a History of the Steam Locomotives used on the Berlin City, Circle and Suburban Lines. By Herr W. Hubert. Berlin, W.9: Verkehrswissenschaftliche Lehrmittelgesellschaft m.b.h., Voszstrasse 6. 6 in. by 8½ in. 63 pages. 36 illustrations and 6 folding tables at end, giving dimensions, &c., of different classes of locomotive. Price 2.80 Rm.—This informative little volume is one of a series describing the locomotives and rolling stock of the German State Railway, issued under the direction of Herr Hermann Maey, in association with the Transport Section of the German Students' Association. As described in our issue for August 25, 1933, the City Railway, or Stadtbahn, in Berlin, has been in operation now for nearly 52 years, the Circle, or Ringbahn, line having been opened earlier, in 1877. On these lines and the suburban sections connecting with them a very large traffic has long been carried, steam operation having been in force until quite recent years. During the course of time many different designs of tank locomotive have been employed, and Herr Hubert has performed a most useful service in bringing together these photographs of almost every type used on the line, with leading particulars and information concerning the builders, the services on which the machines were used and the reasons for the distinctive features of each design. It is something of a surprise to learn that the first locomotive fitted with the Schmidt superheater was put into regular work on the Stadtbahn. The first part of the book deals with the locomotives belonging to the various private railways which sent trains to or over the Stadtbahn before the general change to State ownership in Prussia, and the second part to the State period with the locomotives introduced by the Berlin Divisional Management. Most of them are, of course, of the passenger type, but some goods and shunting locomotives are also illustrated. The

tables give as much information as can be collected at this date regarding the whereabouts of the different locomotives, both before and after their Stadtbahn service. Since the introduction of electric traction the best of them have been used on fast light passenger trains working in various parts of the country, as explained in our overseas section for June 9, 1933. We can recommend this interesting book, which is dedicated to Herr E. Knoche, one of the most competent authorities on Prussian locomotive history.

Rails de France: Revue des Grands Réseaux des Chemins de Fer Français.—It has been the pleasant custom of certain of the French railways to provide for their passengers reading matter in the form of monthly publications describing matters of interest to be found in their respective territories and on their respective railways. The former individual journals of each system are now replaced by this new publication, which is to be issued on the first and fifteenth of each month from 3, Rue d'Edinbourg, Paris (VIII). It is attractively turned out and amply illustrated, and this first issue is appropriately enough devoted to the Sunny South. There is an introductory foreword by Monsieur Ch. Guiffet, President of the General Managers' Conference of the French main-line railways.

Aluminium.—It is always a pleasure to receive the publications of the British Aluminium Co. Ltd., King William Street, London, E.C.4, and the last two booklets issued are fully up to the high standard set by their predecessors. One, No. 355, deals with aluminium in architecture and decoration, and the other, No. 357, deals with aluminium sheet metal work. Striking illustrations are given in the former of the decorative effects of aluminium, and it is pointed out that, besides the natural colour, a pleasing alternative is obtained with the anodising process, which gives a pearl-grey film of extreme hardness. This film may be supplemented by immersing the anodised article in a bath of aniline dye to give colour effect. Further, anodising forms a protection against atmospheric action upon aluminium. The booklet dealing with aluminium sheet metal forms a comprehensive treatise on the subject. The use of aluminium in railway rolling-stock construction is on the increase, and justifiably so when it is realised that it is a metal 65-67-69 per cent. lighter than steel, brass, and copper respectively. Where greater strength is required than can be given by pure aluminium, an alloy may be used, such as aluminium-silicon or aluminium-manganese. Still higher strength is provided by Duralumin.

The Institute of Metals: Its Aims and Objects.—An attractively prepared folder has been issued by the Institute of Metals, 36, Victoria Street, London, S.W. 1, specifying the objects and other particulars of the Institute.

THE SCRAP HEAP

We are glad to be in a position to assure our readers that the announcement of the death of Mr. Norman Wilkinson, whose beautiful L.M.S.R. posters are so well known, is greatly exaggerated. We took tea with Mr. Wilkinson the other day and found him in excellent health.

* * *

COMPOSITION OF RAILWAY BOARDS

The following table analyses the composition of the boards of the four group railway companies according to social rank:—

	Peers	Barts.	Knights	Esqrs., Total &c.	
G.W.R.	7	5	3	7	22
L.M.S.R.	1	2	8	9	20
L.N.E.R.	1	2	3	15	21
S.R.	4	1	3	8	16

Thus, the most aristocratic railway board is the Great Western, comprising seven peers, five baronets, and three knights out of a total of 22 directors. The most "untitled" board is the London & North Eastern, 15 of its 21 directors being esquires, &c. Ten railway directors are also Members of Parliament: G.W.R., four; L.M.S., two; L.N.E.R., two; and Southern, two.

In the course of a recent address on "Modern Railway Advertising," Mr. C. Dandridge, Advertising Manager, L.N.E.R., compared poster advertisements of 1851, 1923, and 1933. Below we reproduce specimen designs showing the styles favoured at each of these periods. The unsurpassed clarity of the modern Gill Sans type gives the 1933 poster first place, at any rate to modern eyes. If we had to choose between the designs of 1851 and 1923 we should strongly favour that which offered our mid-Victorian grandparents special travel facilities to the great Exhibition in Hyde Park.

GOOD ADVICE TO RAILWAY STOCKHOLDERS

Under the heading "A Message to Every Railway Stockholder," the British Railway Stockholders Union Limited has issued the following:—

Stockholders should help themselves by using the railway where possible and by influencing others to become railway-minded.

Travel more by rail yourself, and induce your friends to do likewise. Stay at railway hotels.

Time is money. Most journeys made by car can be made more cheaply, safely and comfortably by rail.

If every stockholder spent £10 more on the railway next year there would be a dividend on the ordinary stock.

The railways undertake local cartage. Information may be had from the local railway goods agent.

Reduced fares are available for conferences, regimental dinners, parties of eight, &c. Information may be had from the stationmaster.

Motorists can take their cars with them by rail at reasonable rates. Information may be had from the stationmaster.

The railways move furniture at all-in rates and offer reduced fares to the owner and his family. The goods agent can give particulars.

For substantial tonnage you can now obtain flat rates, irrespective of distance. This will simplify your transport problem. Inquire from your goods manager.

Remember that every additional passenger, parcel, and consignment of merchandise improves your position as a stockholder.

All stockholders should join the British Railway Stockholders' Union Limited, 25, Victoria Street, London, S.W.1.

Use the rail and improve your income.



Under the title "Ashton Davies says: We mean to ring that bell!" the "LMS Magazine" published the above in its February issue

What is believed to be a record collection of cigarette cards has been made by Mr. George Horne, an L.M.S. railway guard of Bedford. He has collected over 90,000 different cards.

Wagging his finger at Sir Josiah, Mr. Thomas said: "I should like to tell you, Stamp, that if there was a débâcle in this country, and we were both driven to work for our living, I should stand a better chance than you."—Press reports of presentation by the Dominions Secretary of British Empire Medal to Driver Gilbertson of the "Royal Scot."

LETTERS LOST IN TRAVELLING POST OFFICE

Thirteen letters, which were posted in London and the Home Counties in 1915, 1916 and 1917, have just been delivered in the West of England. Each letter was enclosed in an "O.H.M.S." envelope, which also contained an apology from the Postmaster-General. A G.P.O. official told the *Evening Standard* the story of the unlucky thirteen. He said: "A travelling Post Office van which has been in service on the Great Western Railway for many years was sent to Swindon last week to be renovated. While the coachbuilders were working on the van they found thirteen letters behind the sorting racks. The letters had slipped behind the partition. Two had been posted in 1915 and the others in the succeeding years."

ST. NORTHERN RAILWAY
PETERBORO
OCTOBER.
EXCURSION TRAINS
PASSENGERS FOR THE
EXHIBITION
FARES UNTIL FURTHER NOTICE
6. 5. 3.

LONDON & NORTH EASTERN RAILWAY
HOLIDAY EXCURSIONS 1923
Every SATURDAY
MAY 21 to JUNE 20 (including Bank Holiday Saturday May 25th)
SHEFFIELD, DONCASTER, HULL, WORKSOP (via the WHEAT), RETFORD, GAINSBORO', BRIGG.
GRIMSBY DOCKS
CLEETHORPES
BOOK IN ADVANCE

LONDON & NORTH EASTERN RAILWAY
CLACTON
ON SEA
5/-
SUNDAY, 10th SEPTEMBER
From Norwich (Thorpe)
10.40 8.50
1.5 11.20
IT'S QUICKER BY RAIL

1851

1923

1933

Examples of three periods of railway poster advertising

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

Indian earthquake damage repairs and Calcutta-Madras air service—Named expresses with individual colours in Australia—Transandine flood damage—Railway-owned and -worked airways in Africa—Manchurian railway reorganisation

INDIA

Repair of Earthquake Damage

The Bengal & North Western Railway is the only system on which traffic was seriously interrupted by the earthquake in Bihar. Repairs were promptly undertaken, and by January 19 communication was re-established on most sections in the affected area. The ferry service between Chitaunighat and Bagaha was augmented to facilitate the transport of passengers and relief stores to the Champaran district. Within a few weeks through running between Sonepur and Mozufferpur, between Mozufferpur and Samastipur, and between Thawe and Sidhwalia was resumed. Other sections are being reopened as repairs are effected. The chief locomotive works of the East Indian Railway at Jamalpur were soon in commission again with 84 per cent. of the normal staff. The railways offered specially reduced rates for the conveyance of relief stores to the earthquake-stricken areas, and in some cases free transport was afforded to Red Cross stores.

Calcutta—Madras Air Service

It is officially announced that the Madras air taxi service will operate twice a week between Calcutta and Madras, stopping at Gannavaru, Vizagapatam and Puri to connect the east-bound and westbound services of the Indian Trans-Continental and Indian National Airways. Air mail correspondence, inland and foreign, will be accepted for transmission by this service. The first plane left Madras for Calcutta on February 10.

Railways in the Assembly

The Legislative Assembly adopted a resolution urging that immediate and adequate steps should be taken by the Railway Board to redress the grievances of the general travelling public, and particularly of the public travelling by the Assam Bengal Railway. The mover narrated the inconveniences he had personally experienced on the Assam Bengal Railway.

The extension of the life of the Assembly involved a re-election of the Public Accounts Committee. Some members pointed out that the old committee had not completed the examina-

tion of the Railway Appropriation Accounts and asked if the new committee would finish the unconcluded business. The Law Secretary expressed the view that the new committee must take up pending work. The President ruled that the new committee could take up the unfinished business of the previous committee. Railway matters will, therefore, shortly come up before the new Public Accounts Committee.

NEW SOUTH WALES

Named and Individually Coloured Expresses

In order to popularise the train service between Sydney and the many beautiful tourist resorts in the Blue Mountains, the Railway Department introduced about three years ago a special train, which not only provided more comfortable accommodation than hitherto, but also substantially reduced the schedule then existing for expresses on that particular section of the western line. Further publicity was given to the venture by naming the train The Caves Express, which has since become a very popular form of travel to and from the Blue Mountains. During the summer this express runs daily, and often in two parts at week-ends, and on public holidays. The express derives its name from the world famous Jenolan Caves, which are reached by motor coach from Katoomba and Mount Victoria. The 78 miles between Sydney and Mount Victoria, where the express terminates, are covered in 2 hours 25 minutes, during which the train has to climb 3,495 feet, the summit at Blackheath being reached at mileage 74.79 ch. The timing represents smart running, when the sharp curves and steep grades encountered in climbing the Blue Mountains are taken into consideration.

Other Special Expresses

The Department next turned its attention to the service between Sydney and Newcastle, on the main northern line, which was considerably speeded up with the introduction of two new expresses which now run daily throughout the year. Named the Inter-City Express and the Northern Commercial Limited, respectively, they are much appreciated by business men, and the travelling

public generally, in that it is now possible to travel from one city to the other, and return on the same day. The distance from Sydney to Newcastle, 104 miles, is covered in 2 hours 47 minutes, with only three intermediate stops, reducing the previous best timing by nearly an hour.

As further evidence of the Railway Department's progressive policy a new express was recently placed in service on the Illawarra line. Named the South Coast Daylight Express this train runs between Sydney and Nowra daily, and serves an extensive area in which are many beautiful seaside and mountain resorts. As frequent stops are made in the last 40 miles of the journey from Sydney, the apparently rather slow timing of 3 hours 10 minutes for the run of 95 miles, is explained. Otherwise the Daylight Express bears comparison with the Caves and Inter-City expresses, and is well patronised by tourist and traveller alike.

Rolling Stock Used

The coaching stock for each of the named expresses is identical in make up and construction. Each train consists of six corridor coaches, with vestibule connections, which will accommodate 212 passengers, 72 first-class and 140 second-class. Seating is in the form of two each side of a central corridor, with a table to every four passengers. The seats are upholstered in leather and moquette. Light refreshments are obtainable en route, at a buffet provided on the train. While identical in construction each express has been given a distinctive colour scheme, as an aid toward further publicity.

The Caves Express set is painted royal blue, with cream upper panels and red lining, while the Inter-City and N.-C.-L. coaches are red and cream. The Daylight Express now running is painted a very pleasing shade of green, with cream panels and lining in red. A later development in the publicity direction has been the allotting of special engines to each of the expresses painted in harmony with the colour scheme. The first engines to appear were two for the Daylight Express painted green with red and yellow lining and named *Illawarra* and *Cambewarra* respectively. They were followed by two special engines for the Inter-City Express painted red with yellow and black lining, named *Hunter* and *Hawkesbury*. The naming of locomotives incidentally is quite a departure from N.S.W. Railways standard practice, and has since been extended to other engines. One of the N.S.W. P class 4-6-0's which works regularly over the Kyogle railway into Melbourne Street, South Brisbane, is now named *Queenslander*. Following these special engines for the above expresses, three 35 class 4-6-0's have now been turned out from the Eveleigh Workshops, painted royal blue, with cream

lining, and red running frames lined yellow. They have been put to work on the Caves Express and look extremely smart in a livery that previously has only been seen on the N.S.W. Railways for engines allotted to work the Royal Trains during the visit of H.R.H. the Prince of Wales in 1921, and the Duke and Duchess of York in 1927. [See photo on p. 300—ED. R.G.]

PERU

Trouble on the Guaqui—La Paz Line

It was reported recently from Puno, on the Peruvian side of Lake Titicaca, that at Guaqui a number of Indians had revolted, seized the barracks, destroyed a train and cut telegraph wires. The local officials of the Peruvian Corporation, owners of the railway, state that the inhabitants repulsed the attack and that several of the Indians were killed. It is believed that recruiting for the army and the agricultural crisis caused the revolt, but the Bolivian Government makes light of the affair.

ARGENTINA

The Transandine Disaster

The damage to the Transandine Railway, already mentioned in these columns as caused by the disastrous wash-out at the beginning of January, turned out to be much more serious than at first reported. Miles of line have been completely washed away, numerous bridges destroyed and months must elapse before normal traffic can be resumed. The cause of the floods is now attributed to the collapse of a glacier at the head of the river Plomo, which runs into the Tupungato, the principal tributary of the River Mendoza. The official report of the Transandine management regarding the damage, states that between Kms. 126 and 133 the line has completely disappeared; at Km. 58 a steel bridge of 75 m. span was carried 700 m. down the river; five 20-m. spans of the bridge at Km. 24 disappeared entirely; at Potrerillos a 75-m. steel bridge was dragged 500 m. away. Serious wreckage has been caused at 39 points on the line by what might be described as a wall of water 80 ft. high, which tore through the valley of the river Mendoza carrying everything before it. There was very little loss of life, chiefly due to the fact that those lower down heard the roar of the approaching waters and fled for safety high up the mountain side. This is how the many guests enjoying the summer season at the Cacheuta Hotel, the famous Andine thermal establishment, were able to escape.

It is considered that Mendoza will not be free from danger of a repetition of the disaster until March. The managements of the Transandine and of the Buenos Ayres and Pacific Railways are doing all they can to minimise the personal inconvenience caused by the suspension of the train service,

chief of which is the isolation of several hundred Argentine tourists on the Chilean side, whose return is impeded not only by the destruction of the railway but also by that of the road.

SOUTH AFRICA

State Takes Over Union Airways

As foreshadowed in the Railways & Harbours Control Act of 1931, which permits the Minister of Railways "to purchase aircraft for the carriage of persons and goods" and make contracts in connection therewith, the services at present performed by Union Airways were taken over by the Railway Department as from February 1 and will in future be under the direct control of the General Manager.* The Union Government will carry out the terms of certain contracts into which Union Airways have entered for the acquisition of new aeroplanes. As a measure of further security it has been decided without delay to triangulate the Union, dividing the country into a series of triangles at the apices of which directional wireless will be instituted so that any planes flying within the specified triangle will be able to obtain their exact bearings without difficulty.

Acceleration of Services

Plans of far-reaching importance are, it is understood, at present under consideration by the Government calculated to bring about an all-round acceleration of railway services operating throughout the Union. This improvement, it is learned, will entail a programme involving expenditure of £10,000,000 over a period of ten years. An important feature of the scheme, apart from the obvious benefits to be conferred generally, is that it will go a long way towards the absorption of the Union's unemployed, and this may be regarded as the first national scheme to meet unemployment. This ten-year programme will include the re-equipment and strengthening of the permanent way on the main trunk railways so as to secure greatly accelerated train services for both goods and passengers. It is hoped that the work will be started this year, when Parliament, which assembled on January 26, will make the necessary financial provision, and it will, where necessary, include the straightening out of the through routes, where this can be economically effected, by the construction of chord lines.

As far as passenger trains are concerned, the aim will be to develop a 20-hour service between Johannesburg and Capetown as against the present timing of 28½ hours in the case of the Union Limited and 29½ hours for the Union Express. Such a service would mean an average speed of 50 m.p.h. over the whole journey, while goods trains will be run eventually, it is hoped, at an average speed of 30 m.p.h. for the Rand-Cape traffic. Similar accelerations will be developed on other

* As mentioned on page 203 in THE RAILWAY GAZETTE of February 9.—ED. R.G.

routes, and this will mean, when plans have materialised, that goods trains will travel at average speeds in excess of those of the present passenger trains. It must be emphasised that the scheme outlined constitutes nothing more than the skeleton of plans not yet adopted, but it may safely be stated that they will shortly assume a more practical form, and are, it is learned, favoured by Mr. Pirow, the Minister of Railways.

THE FAR EAST

Armed Protection of Trains

Owing to the large number of attacks by bandits on the trains of the Chinese Eastern Railway, arrangements have been made for international trains operating on the western section of the line to be provided with armed guards. Each international train will be accompanied by 100 Manchukuo soldiers under Japanese officers.

Imports of Railway Materials from the United Kingdom

During the four years 1929-32 imports of railway materials and rolling stock into China from the United Kingdom as compared with other countries have, with one exception, steadily risen. The table below, compiled from *Trade and Economic Conditions in China* (1931-33), published by the Department of Overseas Trade, shows the percentages which Great Britain can claim during these years.

	Percentage Share from the U.K.			
	1929	1930	1931	1932
Locomotives ..	3	16	38	41
Carriage and wagon	7	19	2	83
stock and railcars	7	11	13	27
Other materials	7	11	13	27

Reorganisation of the South Manchuria Railway

At the annual meeting of the South Manchuria Railway at Tokyo on December 20 last, the President of the company, Count Hayashi, referred to a proposed scheme for reorganisation and assured the shareholders that their rights and interests would be protected, but so far nothing definite had been decided. The proposed reforms include the making of the South Manchuria Railway Company into a holding company to be named "The Manchuria Enterprise and Development Company" as parent company with sixteen subsidiary organisations working independently and of which the railway would be one. At a meeting at Changchun Mr. Yoshiaki Hatta, Vice-President of the South Manchuria Railway, and Lieut.-Gen. Kuniaki Koiso, Chief of Staff of the Kwantung Army, stated that both the South Manchuria Railway and the army would respect and protect the agreement. The proposals are far-reaching and would completely alter the status of the South Manchuria Railway as an administrative authority. It is understood that all companies on becoming independent of the railway administration are to be governed under the Laws of Manchukuo.

PROTECTION OF RAILWAY PROPERTY FROM FIRE

Demonstration of timber carriage shed and wooden carriages therein protected by Grinnell sprinklers at Croydon, Southern Railway

A REMARKABLE demonstration, which should be of interest to all railway officers, took place on February 15, at East Croydon. In the now disused Fairfield yard of the Southern Railway a shed had been specially equipped with a Grinnell Automatic Sprinkler and Fire Alarm system, and in it were placed three rakes of old coaches, as shown in the accompanying plan. At the invitation of Mather & Platt Limited, of Park Works, Manchester, and Park House, Great Smith Street, Westminster, a distinguished party, including railway directors and officers, assembled at the shed to witness the effect of the sprinklers upon a fire started in the centre of the coaches. Among those who accepted the invitation were the following:—

Southern Railway: Sir Charles L. Morgan, Sir John Thornycroft, Sir Herbert Walker, Mr. G. Ellison, Mr. R. E. L. Maunsell, Mr. Herbert Jones, Mr. E. J. Missenden, Lt.-Col. G. L. Hall, Mr. E. F. Bone, Mr. Wentworth-Shields, Mr. C. B. H. Clark. *Great Western Railway:* Mr. B. Carpenter, Mr. H. W. Morgan, Mr. C. T. Cuss, Mr. Quelch, Mr. F. W. Lampitt, and Mr. B. Humphrey. *London & North Eastern Railway:* Mr. C. J. Brown, Mr. H. H. Mauldin, Mr. Barrington Ward, Mr. Liddell. *London Midland & Scottish Railway:* Col. F. A. Cortez Leigh, Mr. F. E. Fox, Mr. J. Boyd, Mr. T. Hornbuckle. *London Passenger Transport Board:* Lord Ashfield (unable to be present owing to indisposition), Mr. W. A. Agnew, Mr. E. T. Brook, Mr. A. Graham. *Pullman Car Company:* Mr. W. J. Sedcole. *Buenos Ayres Great Southern Railway:* Mr. J. M. Eddy. *Egyptian State Railways:* Mr. N. Ablett. *Antofagasta (Chili) & Bolivia Railway:* Mr. P. D. Greville. *Ministry of Transport:* Col. A. C. Trench, Lt.-Col. E. P. Anderson, Mr. O. W. J. Watson. *Messrs. Rendel, Palmer & Tritton:* Mr. H. Hackwood, Mr. A. W. Goldsack. *Messrs. Robert White & Partners:* Mr. Bruce G. White. *Messrs. Merz & Partners:* Mr. F. Lydall, Mr. S. G. Redman. *Messrs. Fox & Mayo:* Mr. Eric Fox. *Consulting Engineer to Government of New Zealand:* Mr. Ranald J. Harvey. *Messrs. Livesey & Henderson:* Mr. Neil Henderson, Mr. J. J. Lawton. *London Fire Brigade:* Major Morris, Commander Firebrace, Major Jackson, Mr. Kerr.

In a few words Sir Herbert Walker introduced Mr. L. E. Mather, the Chairman of the firm, which he characterised as the greatest experts on fire sprinklers in the world. Mr. Mather, after thanking the Directors of the Southern

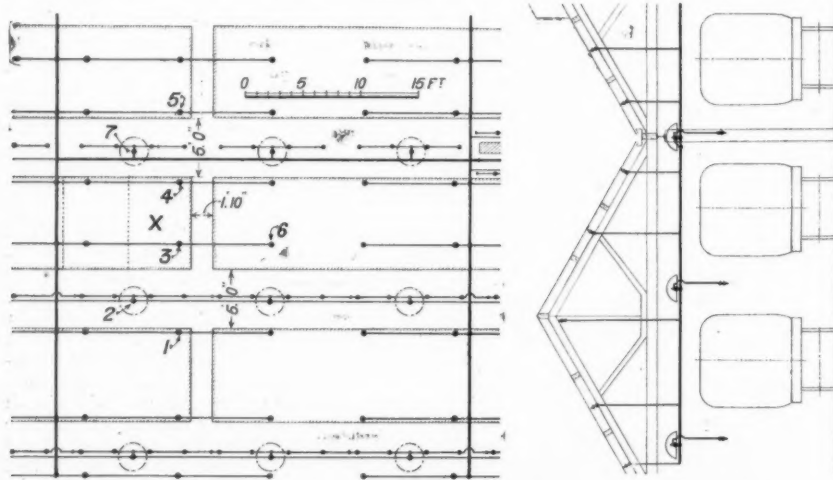
Railway for enabling the demonstration to be held at Croydon, explained that a second one was also taking place that day wherein an attack similar to that they were about to witness upon railway coaches was being made upon the new L.M.S.R. steamer *Princess Maud* in the course of a trial run on the Clyde. The passenger accommodation of the ship, he said, was equipped with Grinnell sprinklers and a fire was to be started in one of the cabins to test their efficacy. Sprinklers, he said, had been in use for 50 years and the first fire quelled by them was at a cotton mill in 1884.

Explaining the equipment, he likened the sprinkler piping system to a tree with a 6 in. trunk (the main) branching out into a number of pipes of decreasing diameters and finally reaching 1 in. pipes. These were full either of water or, where there was fear of frost, with air forced in by a special arrangement of valve and pump with water under pressure behind it. In parentheses it may here be remarked that such a system in a railway carriage shed or workshops would normally be connected with the regulation fire mains. In cases such as this temporary installation at Croydon, or in the unusual event of water from the mains not being available, a tank and pump are necessary instead. Here the ingenuity of the firm has found further scope in controlling the pump automatically. Actually in case of fire, as was demonstrated, the functioning of a sprinkler, by releasing the pressure in the piping, actuates an alarm gong and also throws in a switch whereby the motor driving the rotary pump is started up. The tank at Croydon held a supply of 23,000 gallons.

The Sprinkler Described

But to return to Mr. Mather's remarks, he next explained the sprinklers themselves. Two different methods of providing fire protection were, he said, to be utilised for this demonstration. Automatic sprinklers were inserted in the piping system at the ceiling or roof level to

give protection to the building and to its contents generally. In addition an extra device, namely, the multiple jet control, would be utilised at a lower level to provide water curtains in the aisles between coaches. Both of these devices were fully automatic and used a frangible bulb made of Quartzoid as their operating element. The bulb was filled with a liquid which is highly expansible when subjected to a rise in temperature. The pressure generated by the expanding liquid was sufficient to shatter the bulb when a pre-determined temperature was attained, and this bursting of the bulb caused a valve to open. In the case of an automatic sprinkler, water passed directly to a special deflector plate when the valve was opened; with the



Plan and end elevation of shed, showing positions of coaches and lay out of sprinkler installation

multiple jet control the water passed through pipes to specially designed distributors. Upon the conclusion of Mr. Mather's brief remarks, the party first saw a standard single sprinkler in action over a 100-sq. ft. area marked on the floor of the shed.

The main demonstration then took place. Here, in addition to the two pipe-lines of sprinklers arranged over each rake of coaches, as shown on the plan, there



Single Grinnell
sprinkler



Grinnell multiple control
valve

were also rows of multiple-jet controls, one row in each aisle between the rakes, each control feeding four distributors. A conical metal hood protects the valve from water from the sprinklers which, being close to the roof, are above them, and at the same time tends to collect and concentrate upon the valve, the heat rising from a conflagration.

The Demonstration

The actual demonstration was started by a representative of the railway igniting a mass of shavings in the compartment marked X on the plan. This compartment

was in the centre of the six coaches and, like all the others, had its doors and windows shut. The fire was confined to the inside of the compartment for some 30 minutes, even though additional air was admitted to the compartment through holes specially drilled beforehand in the lower panels of the coach. As the visitors meanwhile could see nothing happening, it was decided to break a window on one side and break a small hole in the panelling on the other, to admit more air. In the opinion of witnesses this, though it had the immediate effect of enlivening proceedings, probably saved the coach roof from being burnt before the sprinklers started to function and so, as will be seen, in the long run delayed the conclusion of the demonstration. As it was, the flames leapt out sideways through the vents so made, and 32 minutes from the firing of the compartment the heat started the first single sprinkler, shown as No. 1 on the plan. Four seconds later No. 2, the first multiple control valve, was actuated, and after another six seconds the alarm gong and pump came into action. Other sprinklers followed in the order shown, five single and two multiple controls in all coming into use before the supply was finally shut off 1 hr. 35 min. after the fire was started.

The Result

It was remarkable that immediately the sprinklers started, the fire was completely enclosed within a curtain of water, and it was possible for visitors to view the fire in comfort at very close range from the coaches on each side, which were only 5 ft. away from what quickly became a roaring inferno. Moreover, though the coaches were close-coupled, being old 13-ton 33-ft. six-wheelers of the suburban type, the adjacent coach in the same rake, the end wall of which was within a couple of feet of the burning compartment, was never burnt, though the fire raged in the ignited coach for over an hour and a half. The wooden roof and trusses of the carriage shed were neither blackened nor blistered, though the trusses were within 4 ft. or 5 ft. of the coach roof and one was directly over the fire. Furthermore, one of the pipe mains was within 2 ft. of the coach roof, yet its



Left:—View of blazing compartment from adjacent coach 6 ft. distant and through streams of water over surfaces of both coaches. Right:—Fire breaking out of window and licking multiple jet pipe in aisle between rakes

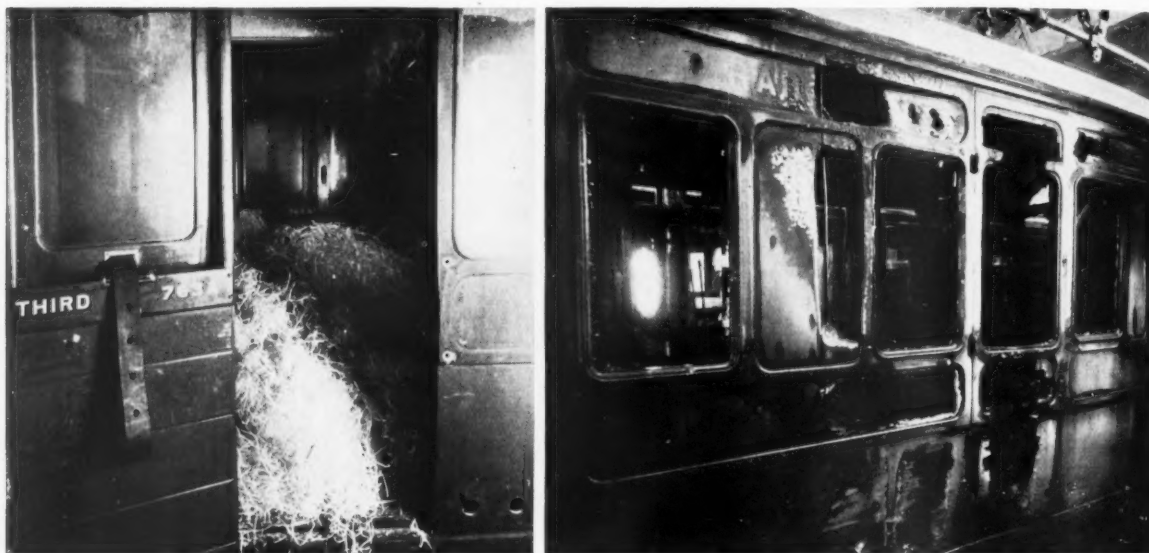
paint was not even blistered or discoloured. These remarkable effects were due to the fact that the blazing coach was coated on the outside with an almost unbroken layer of water from the sprinklers, and the adjacent coaches also were curtained with water.

After over 1½ hours' blazing furiously, the fire had spread to two other compartments only, the three being completely gutted, yet the roof was still intact. For this reason the single roof sprinklers could not throw water

one or two small holes in the roof and sides, made in the main by the force of the hose jet.

Limitation of Damage

It was thus clearly demonstrated that the coach would have continued to burn itself out without endangering either the other coaches or the shed. Obviously a Grinnell sprinkler equipment would ensure that the outbreak of fire in a coach in an unattended carriage shed at night



Left: Compartment X ready for ignition of shavings. Right: Compartments after the fire. The thin shell of panelling left by the fire was knocked out of place by the force of the extinguishing hose both at sides and end of coach

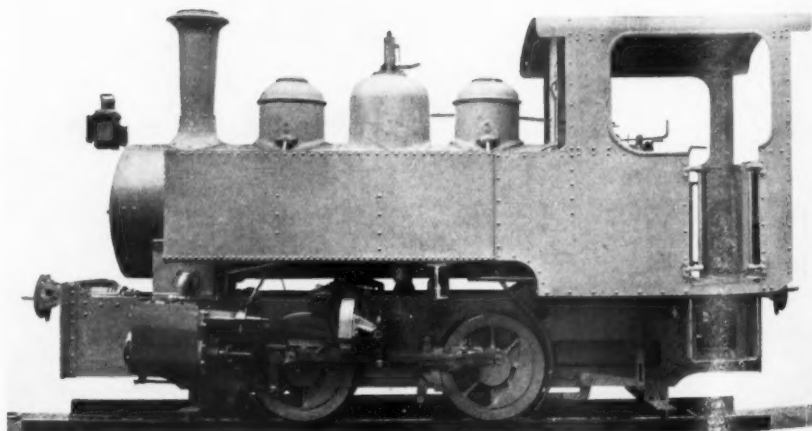
on to the fire itself at all, and they merely rendered the roof practically non-inflammable. It was, in fact, like an umbrella over the fire. Had the fire been allowed to take its normal course and burn the roof before the sprinklers came into action, the latter might conceivably have been able to extinguish the fire before it spread even to the second compartment. As it was, the fire was eventually extinguished with a hose, when it was found that the shell was still practically intact, there being only

would involve the loss of only that coach and would almost certainly have prevented the disastrous consequences of such fires as those which recently occurred at Eastleigh, Wolverton, York, and at Salt River Works, South Africa.

Grinnell sprinklers are used by railways in almost every part of the Empire: they achieve their object with the use of very little water and secure insurance premium rebates of from 30 to 75 per cent.

A Neat Industrial Locomotive

For work on a gold mine in South Africa the locomotive shown in the accompanying illustration has recently been supplied by John Fowler & Co. (Leeds) Ltd. The boiler feed is provided by two Gresham & Craven combination injectors. Cylinder lubrication is by a Detroit sight feed lubricator in the cab. The diameter of the wheels is 2 ft. 6 in. and the wheel base 4 ft. 6 in. The boiler works at a pressure of 180 lb. per sq. in., the heating surface measures 318 sq. ft., and the grate area 6 sq. ft. The total weight in working order is 13½ tons.



ATLANTIC TYPE LOCOMOTIVE FITTED WITH POPPET VALVE MECHANISM, L.N.E.R.

By the courtesy of Mr. H. N. Gresley, C.B.E., Chief Mechanical Engineer of the London & North Eastern Railway, we are enabled to reproduce a photograph of a class C.7 type engine, No. 732, a three-cylinder Atlantic belonging to the former "Z" class introduced on the old North Eastern Railway by the late Sir Vincent Raven, K.B.E., during his régime as Chief Mechanical Engineer of that line. The engine illustrated has recently been fitted by Mr. Gresley with new cylinders equipped with R.C. poppet valve mechanism of the same pattern as those used on the "Shire" class engines of the L.N.E.R., with which they are interchangeable. The new cylinders are 17 in. diameter by 26 in. stroke, the diameter of the poppet valves being $6\frac{1}{8}$ in. for both steam and exhaust. The engine as originally built had cylinders 16½ in. diameter by 26 in. stroke with 7½ in. diameter piston valves. The valve motion of the engine as originally constructed consisted of three sets of Stephenson link motion driven by eccentrics on the crank axle, the whole of the valve gear being thus located inside the frames. The running board of the locomotive has been raised and the steam piping rearranged in conformity with L.N.E.R. standard practice, short, straight, direct pipes outside the smokebox being used for the outer cylinders instead of inside as before. The dimension of 7 ft. 5 in. between the centre of the trailing bogie wheel and that of the leading coupled axle has, in the rebuilt engine, been increased to 8 ft. 5 in. The tractive effort at 85 per cent. of the boiler pressure (175 lb. per sq. in.) was 19,320 lb., and is now 20,446 lb. Leading dimensions are:—

Wheels, coupled, diameter	6 ft. 10 in.
" leading bogie, diameter .. .	3 ft. 7½ in.
" trailing truck, diameter .. .	4 ft. 0 in.
Wheelbase, coupled	7 ft. 7 in.
" total engine	30 ft. 6 in.
Boiler diameter	5 ft. 6 in.
" steam pressure	175 lb. per sq. in.
Heating surface, firebox	185.0 sq. ft.
" tubes	1,112.5 sq. ft.
" superheater flues	534.5 sq. ft.
" Total	1,832.0 sq. ft.
" superheater	437 sq. ft.
" Combined total	2,269 sq. ft.
Grate area	27 sq. ft.
Weight of engine in working order	76 tons 2 cwt.

The tender is of the six-wheeled type and fitted with water pick-up apparatus. It has a water capacity of 4,125 gallons and a coal capacity of 5½ tons. It weighs 47 tons, so that the engine and tender together, in working order, weigh 123 tons 2 cwt., of which 41 tons 10 cwt. are available for adhesion.

FRANCE TO COMPLETE HER SECTION OF THE BAGDAD RAILWAY.—According to a Reuters message from Paris, France is to complete the Syrian section of the Bagdad Railway. M. de Martel, French High Commissioner in Syria, is at present in Paris, and it is announced that a convention has been signed for the construction of the line to the Syrian frontier. At present the Orient Express runs through to a small station called Tel Ziouan, on the Syrian-Anatolian frontier, eight miles beyond Nisibin. Passengers are taken thence by car via Kirkuk to join the Iraq section of the line to Bagdad. The old route, aligned before the war, is to be followed. Construction will be superintended by the Régie Générale des Chemins de Fer, which controls the Syrian railways.



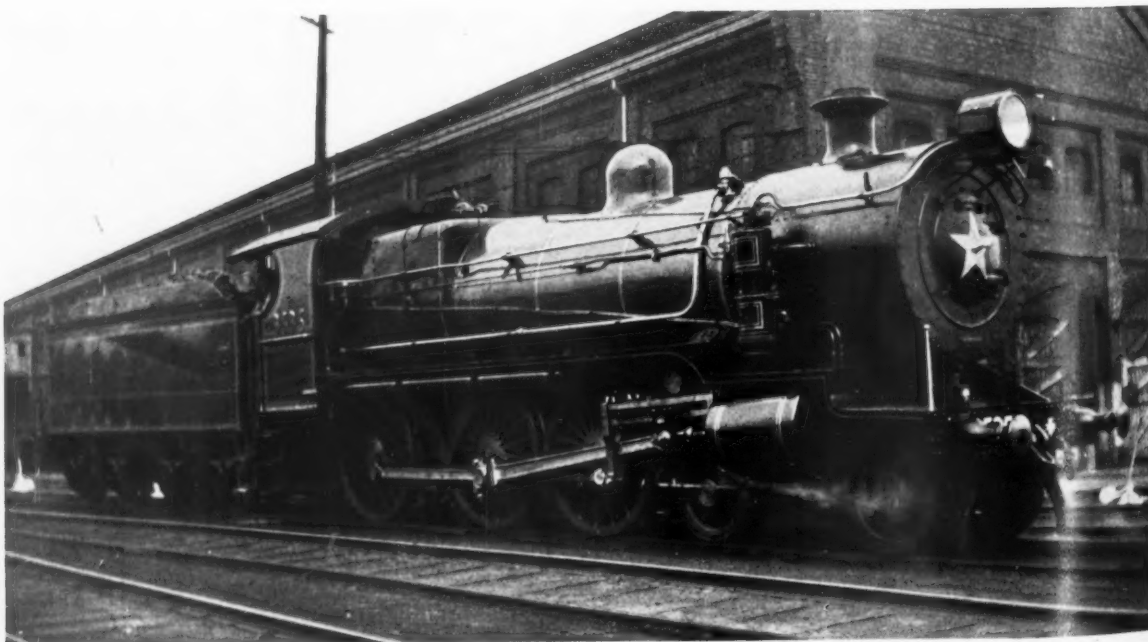


Left: A New York Central express, after running for hundreds of miles at 50 or 60 m.p.h., crawling through the main street of Syracuse, with tolling bell, at 15 m.p.h. Pacific locomotive No. 3278 at head of train and switching engine on left beyond motor traffic. See "Grade Separation in U.S.A." on page 286

Right: Modern traffic problems. A road in Holland with independent tracks for (left to right) pedestrians, cyclists, motorists, and electric trams. Beyond is the canal and the electrified railway. The photo is reproduced by courtesy of the Automobile Association

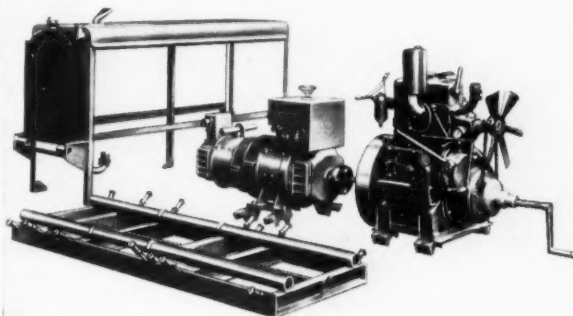
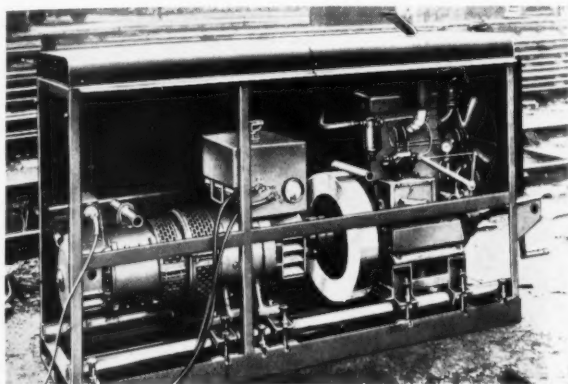


Below: New South Wales Government Railways C 35 class locomotive as specially painted royal blue with cream lining and red running frames lined in yellow, for working the Caves Express, vide page 294



A PORTABLE DIESEL WELDING PLANT

A diesel-electric generator particularly adapted for permanent way welding work has recently been brought out by G. D. Peters & Co. Ltd. with the object of reducing the cost of building up worn crossings



Diesel-electric welding set ready for use (left), and dismantled for transport by hand (right)

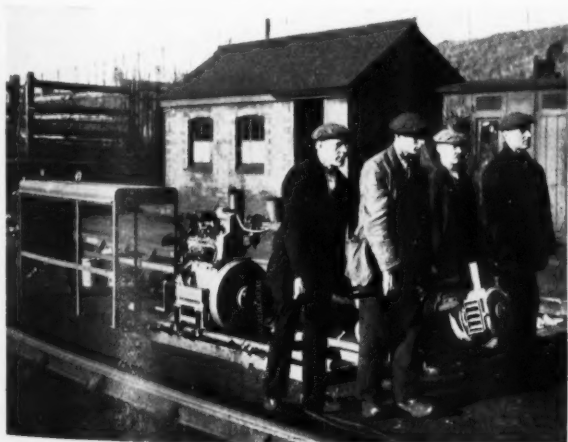
A PART from the cost of labour and of the electrodes used in building up worn railway crossings by electric arc welding, petrol cost is the highest individual item involved and probably runs to something between 9d. and 1s. an hour. The importance of a diesel-electric set lies in its very much lower cost for fuel, probably in the neighbourhood of 2d. to 2½d. an hour. G. D. Peters & Co. Ltd., of Slough, have now brought out such a set, and it has been working successfully for some weeks on the Great Western Railway. It has been designated a Plastic Arc "S" type plant, and besides the main generator for welding, has an auxiliary dynamo for the grinding outfit, so that welding and grinding may proceed simultaneously.

The generator is a screen protected drooping characteristic machine, with endshield type ball and roller bearings and has a welding range of from 30 to 200 amps. at an open circuit voltage of 55 volts, drooping automatically to the required arc voltage according to the electrode used. It is directly connected to the engine by a flexible pin

type coupling. The grinding generator is similarly coupled to the main generator by means of a special butt type coupling and flange mounting. The grinding generator is of 2 kW., 220 volts. The two-cylinder engine is an Ailsa Craig light-weight diesel developing 16 h.p. at 1,440 r.p.m. It has thermo-syphon cooling. A Bosch fuel injection pump and nozzle are fitted to the engine, and the cylinder block and crank case are of Birmabright alloy. The former is fitted with wet type Nitralloy liners. The engine starts easily from cold and runs smokelessly on load. A shunt field regulator designed to give close adjustment of the generator voltage, and a 0-80 voltmeter are mounted on a light metal box fitted over the welding generator. A light portable control box is also provided for the welder.

A 1½ h.p. grinding motor drives the grinding wheel through a rubber sheathed flexible steel shaft. The standard grinding head is fitted with a guard for the grinding wheels.

The main bedplate consists of seven light steel channels,



Moving the dismantled set to another site



Welding a worn crossing in progress

to which are welded two steel tubes carrying the engine and generator. This bedplate, although light, is so rigid as to ensure perfect alignment. An angle iron superstructure is provided so that the machine is completely covered with a sheet steel roof, and may be enclosed by detachable sheet steel side and end doors arranged to interlock so that they can be secured by means of one padlock.

The machine can be dismantled into four pieces, each capable of being handled by six men, and reassembled in three minutes, hand nuts being provided so as to eliminate the necessity for many tools. One of our illustrations shows how the plant separates up for transporting to another site. This is believed to be the first dismantable diesel welding set.

Safety Trains in Germany

(From a German correspondent)

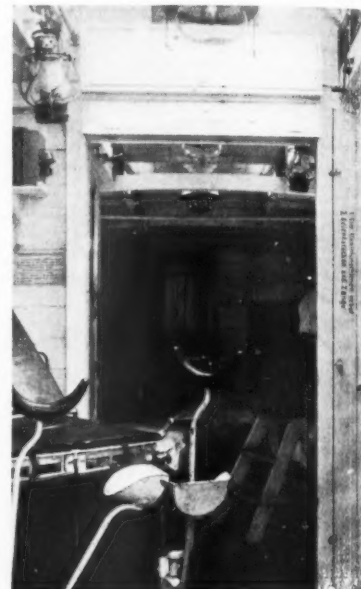
The German State Railway possesses about 132 safety trains, which are distributed over the system of 36,000 miles. When an accident occurs the nearest safety trains are ordered immediately to the spot, a clear road being given them. These trains are provided with technical and medical aid. Each safety train comprises four carriages; an ambulance coach, two coaches for auxiliary apparatus, and one for the crew, which consists of one engineer and about 10 workers. Doctors are not included in the crew as they are usually on the scene of the accident before the train arrives. At places where safety trains are stationed, special alarm equipments are provided by means of which it is possible to call together the staff of the train within 15 minutes.

An important feature of these safety trains is that each train has an independent electric light plant. Darkness at the scene of an accident is very often the cause of a panic among the passengers, which impedes the rescue

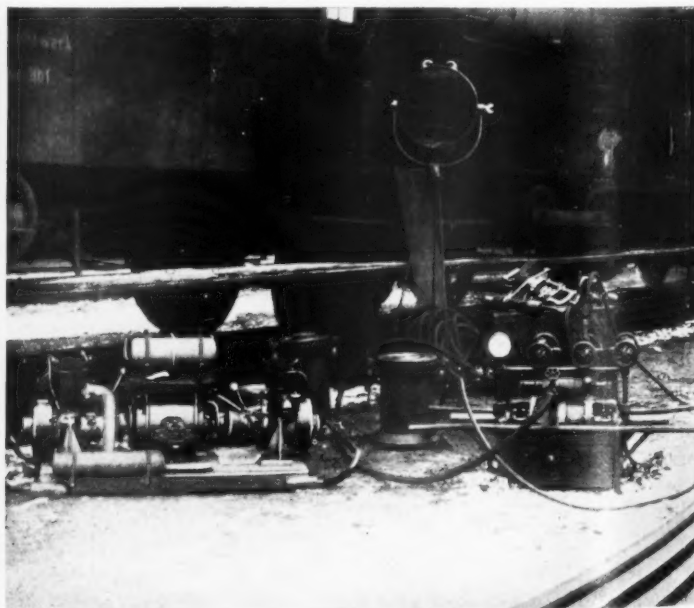
work and makes it more difficult than it might otherwise be. For these reasons, every safety train carries, besides numerous torches and incandescent spirit light, a portable petrol motor driving directly a 2.2-kW. dynamo.

Whereas formerly there were only hand-saws and autogenous fusing burners available, safety trains are now equipped with pneumatic tools, driven by compressed air taken from locomotive brake apparatus. Formerly it took at least two hours to replace a derailed carriage on the rails again, all the work of lifting and winching being done by levers and handles. Now, however, there are special press pumps in operation also operated by compressed air from a locomotive, which in some cases is thus able to replace itself under its own power on the rails.

Every safety train is summoned for a trial run at least once during the year, which takes place either at night or on a Sunday.



Interior of ambulance coach on a German State Railway safety train



Left: Interior of coach containing auxiliary apparatus; Right: Petrol-electric generator set, portable floodlight and pneumatic tools and jack for rerailling derailed vehicles assembled outside the coach in which they are carried

RAILWAY NEWS SECTION

PERSONAL

Mr. F. E. Harrison, District Engineer, Newcastle, L.N.E.R., has been appointed Assistant Engineer, North Eastern Area. Mr. H. Hills, Assistant to the Engineer (Permanent Way and Materials), succeeds Mr. Harrison as District Engineer, Newcastle.

The Court of Aldermen of the City of London, on February 13, approved of the application of Mr. Frank Pick, Vice-President of the London Passenger Transport Board, for freedom of the City.

Mr. T. A. Rose, acting District Agent, Stoke-on-Trent, L.N.E.R., has been appointed Stationmaster, Shipley.

Mr. T. Jones, Goods Agent, Royal Mint Street, L.N.E.R., has been appointed Goods Agent, Marylebone, being succeeded at Royal Mint Street by Mr. H. H. Thames (Poplar Dock).

We regret to record the death, on February 14, of Lt.-Col. F. C. Webb-Ware, C.I.E., who, as Political Officer in tribal Baluchistan, was largely responsible for the Quetta-Nushki-Seistan railway construction, his remarkable influence over the tribes alone making reconnaissance survey possible.

Mr. R. E. Lampitt, Chief Clerk and Assistant Divisional Superintendent, Chester, G.W.R., has been appointed Assistant Divisional Superintendent. A portrait of Mr. Lampitt, and paragraph regarding his career, appeared in our issue for November 24. Mr. H. H. Swift, formerly Goods Agent, Manchester, has been appointed Chief Clerk at Chester.

INDIAN RAILWAY STAFF CHANGES

Mr. L. E. Vining has been appointed to officiate as Deputy Chief Operating Superintendent (Movement) E.I. Railway, as from January 2, *vice* Mr. H. E. Presswell proceeded on leave.

Mr. A. C. Robertson, officiating Deputy Chief Mechanical Engineer (Running), E.I.R., has been granted 8 months' leave out of India, as from February 25.

Mr. E. W. Thomas, Locomotive and Carriage Superintendent, A.B. Railway, has been granted three months' leave as from January 26, Mr. W. Coltman being appointed to act in his stead.

Khan Bahadur Abdul Aziz Khan has retired from the position of Agent,

Mysore Railways, and Secretary for Railways to the Mysore Government.

It is with regret that we record the death, on February 14, after a very short illness, at 6, Southwick Crescent, Hyde Park, of Mr. Dixon Henry Davies, aged 75. Mr. Davies was a solicitor possessed of a long and extensive acquaintance with railway work. He served his articles with Nelson, Barr & Nelson, Solicitors to the Great Northern Railway at Leeds. After leaving them he established in Chesterfield the firm of Davies, Sanders &



The late Mr. Dixon Henry Davies.

Solicitor to the Great Central Railway, 1906-22, and Partner in Beale & Company, 1923-34

Co., who acted for the promoters of the Lancashire, Derbyshire and East Coast Railway. The Parliamentary powers obtained in 1891 were for a system of 170 miles from the Warrington docks of the Manchester Ship Canal through Macclesfield, Chesterfield, Langwith and Lincoln to Sutton-on-Sea, where new docks were to be built for coal shipment. Branches were also authorised from Macclesfield to Manchester and from Langwith to Beighton, whence access was secured to the Midland Railway at Sheffield. The only portions of the scheme which were actually realised were the section between Chesterfield and Lincoln and the access to Sheffield. In 1906, however, Parliament authorised the acquisition of the undertaking by the Great Central Railway Company, and in the same year Mr. Dixon Davies became Solicitor to that company, retaining this position until the end of 1922. After the amalga-

mation Mr. Davies was invited to join the firm of Beale & Company, of Great George Street, Westminster, and was senior partner at the time of his death. Possessed of conspicuous ability and charm, Mr. Davies had many interests outside his railway and legal work. He was devoted to the cause of the canal boatmen on the Grand Junction (now Grand Union) Canal, and it was largely due to his efforts that the attempt in 1930 to prevent children of school age from remaining afloat with their parents was defeated. The funeral service was held last Friday morning (February 16) at St. John's Church, Southwick Crescent, the interment taking place in the afternoon at Cranham Church, near Frinknash, Gloucestershire.

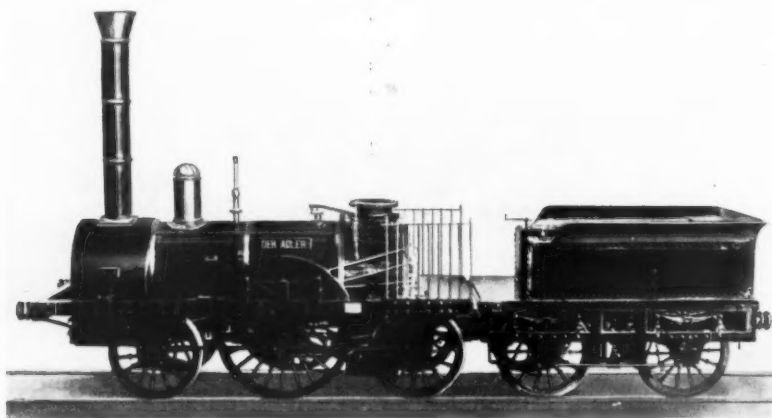
Sir William Ray, M.P., has been appointed Executive Chairman of the British Electrical Development Association.

At the Metropolitan Line offices at Baker Street station, on Monday last, an interesting presentation took place, the occasion being the formal handing over by Mr. Wardle of a handsome silver cigarette case to Mr. Edward Sutton, late Stores Superintendent of the Metropolitan Railway. The gift, which marked the retirement of Mr. Sutton from the service, was a tribute from his old brother officers of many years association and, in addition to being suitably inscribed, bore the facsimile signatures of all concerned. Mr. Sutton came from the Great Northern Railway previous to its amalgamation and was appointed Stores Superintendent to the Metropolitan Railway in May, 1913.

B.S.S. FOR LIGHT ALUMINIUM-ALLOY FORGINGS.—The British Standards Institution have recently issued two specifications for forgings and drop forgings in the two alloys generally known as Duralumin and Y-Alloy. These specifications detail the composition of the alloys, the procedure for selecting test samples from batches of forgings of different types and weights, and the mechanical properties, as shown by tensile and hardness tests, which are to be given by such test samples. The properties of Duralumin make this alloy suitable for use where lightness combined with great strength is important. Y-Alloy forgings may advantageously be used for those parts in which strength at high temperature is of value. Copies of these specifications (Nos. 532 and 533—1934) can be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 2d. each, post free.



Teams of dogs from Alaska, huskies from Siberia, and Greenland dogs employed by the Jungfrau Railway. (See page 311)



The first public steam locomotive in Germany, built by Robert Stephenson & Co. See opposite page, and editorial note on page 287



Photos by]

French station names marked on the permanent way as a guide to airmen. This was referred to on page 814 in "The Railway Gazette" of December 1 last

[P. Adoo

Centenary and Development of the German Railways

By FRANZ F. SCHWARZENSTEIN

February 19 was the centenary of the occasion on which Ludwig I of Bavaria gave his assent to the construction of the first steam railway in Germany. The certificate conferring this privilege was the first of its kind in what is now Germany and so it may be called the "birth certificate" of the whole of the vast German State Railway system. It gave a limited company power to build a railway between Nuremberg and Fürth provided it was built within five years of February 19, 1834, the date of the certificate. The concession was to last five years. The company had further to undertake to make connections with any other railway systems which might be built in Bavaria.

The man to whom the title "the father of the German railways" is properly applied was a Wurtemberger named Friedrich List, who was born at Reutlingen in 1789. After holding sundry professorships in universities, his liberal views compelled him to leave his native state in 1825. He emigrated to Reading, Pennsylvania, where he developed a friendship with Lafayette, and became widely known through his "Outlines of a New System of Political Economy."

In the autumn of 1831, List put into operation a railway which he had built to transport coal from his mine in Tamaqua, Pennsylvania, to Port Clinton on the Schuylkill Canal. Tamaqua and Port Clinton, at that time unimportant settlements in the Blue Mountains, developed into cities of considerable size in a brief period following the opening of this 21-mile line, the first railway ever built by a German. This rapid development inspired List with the idea of building railways in his own fatherland. He drew up a plan for a German railway system, began an encouraging correspondence with the Bavarian Mining Councillor, Joseph von Bander, and eventually became the pioneer of the German railway system. Of the birth of his idea for railways in Germany he said: "In the midst of the wilderness of the Blue Mountains I dreamed of a German railway system. It was clear to me that only with its aid could the Handelsvereinigung achieve its full effectiveness. (The Handelsvereinigung or trade union had been founded by List.)"

Although List enjoyed life in America and was doing well there, he accepted an appointment by President Andrew Jackson as American Consul in Leipzig, and returned in 1832 to Germany. In 1833 he published his plan for a German railway system, and the lines which he proposed as the main arteries of traffic were later built. He helped to build the four-mile line between Fürth and Nuremberg, which was opened on December 7, 1835.

Railway promotion was by no means easy, and as late as August, 1835, the head of the Department of Commerce and Trade assured the King of Prussia that there was no need for railways, since the existing highways fulfilled their purpose very well.

Some two years earlier, in 1833, the Bavarian College of Physicians stated: "The rapid movement must inevitably generate in the travellers a brain disease, a special variety of the *delirium furiosum*. If travellers are nevertheless determined to brave this fearful danger, the State must at least protect the onlookers, for otherwise these will be affected with the same brain diseases at the sight of the rapidly running steam wagon. It is therefore necessary to enclose the railway on both sides with a high, tight board fence."

At about the same time Professor Kips, of the University of Erlangen, issued a pamphlet in which he asserted that the railway would mean the ruin of horse-breeding and would therefore make cavalry and artillery impossible. In case of war, enemy cavalry could swarm into Bavaria without the state army being able to put up any resistance unless cavalry horses could be bought abroad at high prices. The learned professor went on: "If lightning should strike, and if the railway should be destroyed by further transmission of the electrical fire and communication thus interrupted for weeks and months, how could goods then be transported? . . . Though everything delude and deceive, the post office and the licensed coachmen will put an end to the thing." The Nuremberg-Fürth Railway, which was just beginning construction work, bought up all the copies of this pamphlet and burned them.

The original locomotive of the Nuremberg line was the 15-h.p. engine named *Der Adler* (*The Eagle*), built by Robert Stephenson & Co., Newcastle, who also supplied the driver, named Wilson. The latter was regarded so highly by the railway company that his pay was set at 2,250 marks a year, whereas the manager of the line received only 1,360 marks. Along with *Der Adler* which did service for 20 years, and other locomotives bought later, horses were used to draw the freight trains until 1862. In the first operating year, 450,000 passengers were carried, and the receipts were 102,000 marks, which amounted to almost half the capital stock. This first railway, the Ludwigsbahn A.G., is still in existence, but the tracks have served since 1926 for a tramway.

The Nuremberg example proved contagious. On April 24, 1837, the Leipzig-Alten line, 5.7 miles long, was opened, and on October 29, 1838, the

line from Berlin to Potsdam, 16.4 miles long. At the inauguration of the latter line in Berlin the then Crown Prince, later King Friedrich Wilhelm IV of Prussia, uttered the prophetic words: "No human arm will ever stop the progress of this car which will roll through the world." Hardly more than a month later, on December 1, 1838, the first state railway line, from Brunswick to Wolfenbüttel, was brought into operation.

The greatest monument to List's pioneer work is the first long-distance line in Germany, that between Leipzig and Dresden. Reference to the opening in 1837 of the Leipzig-Alten section has already been made. The ceremonious inauguration of the complete line took place on April 7, 1839. The length of 71.75 miles included the first German railway tunnel, 1,683 feet long, near Oberau. The opening of this line is commemorated by an obelisk in front of the main railway station in Leipzig, one of the largest in Europe. List reaped only ingratitude from his contemporaries for his activities and far-seeing plans. Impoverished, and saddened by the disappointments he had experienced, this "German without a Germany," as the novelist Walter von Molo has termed him in a romance dealing with his life, committed suicide in Kufstein on November 30, 1846. A memorial to List was unveiled at Leipzig on Sunday, October 30, 1927.

All the early German railway lines were at first worked with English locomotives. The Leipzig-Dresden line bought its first locomotive, the *Comet*, in Bolton for £1,383. No one recalled that as early as 1815 a steam locomotive had been made in Germany of German materials and also put into operation in Berlin. In 1814 the Prussian Office of Mines sent an official, Eckardt, and Friedrich Krüger, inspector of the Berlin iron foundry, to England. There they studied the possibilities of utilising steam for traffic, and after their return Krüger built a locomotive intended for use in drawing coal cars from the Königshütte in Upper Silesia. On June 16, 1816, a notice in a Berlin newspaper set forth that this "steam wagon" would be exhibited daily from 9 to 12 a.m. and 3 to 9 p.m. for an admission fee of four groschen. It ran on a circular track in the courtyard of the iron foundry and drew a car containing a load of 2½ tons. Unfortunately nothing is known of what became of this first German locomotive. It was discovered that its gauge did not correspond with the gauge of the mine railway in Upper Silesia, and probably it was then used as a stationary engine. The drawings from which it was made also disappeared when the office building of the Berlin iron foundry was partly burned down during an attack made on it by riotous workmen during the revolution of 1848. The only representation of this locomotive extant is on a cast iron New Year card issued by the foundry

in 1816. The second German locomotive was built in 1838 by a Dresden machine shop for the Leipzig-Dresden railway.

The fate of the first locomotive was characteristic of the indifference of the authorities of that day and of the generally confused ideas of the public concerning the value of the "steam wagon." In 1822, a full eight years after it was built, Mining Councillor Henschel proposed using horses to draw the cars on a railroad to be constructed between Bremen and Frankfort-on-Main, while in 1824 the project of another horse-railroad from Brunswick via Hanover and Bremen to Hamburg was gravely discussed. Even when the Nuremberg-Fürth railway was opened, no one foresaw the future development of the railway system in Germany. In 1839 some 92 miles were in operation, and the figure had risen to 341 miles only a year later. During the ten years up to 1850 the total increased to more than 3,725, and by 1870 to about 12,400 miles. The economic upward swing following the Franco-Prussian War extended also to railway construction, and in 1913 the German railway system had almost 40,000 route miles. The loss of Alsace-Lorraine and other territory as a result of the war brought the figure

down to about 36,000 miles. There were then in Germany, in addition to a large number of private and municipal railway undertakings, eight large state systems. The largest of these were the Prussian system, with 21,383 miles of line; the Bavarian, with 5,300 miles; the Saxon, with 1,100 miles; and the Wurtemberg system, with 1,340 miles. Baden, Hesse, Mecklenburg-Schwerin and Oldenburg also had their own smaller systems.

These eight systems, with the exception of those of Wurtemberg, Oldenburg, and Baden, which originally belonged to the respective states, had developed from private railways which had come into the possession of the states in the course of time and had been further built up. Through the taking over into state ownership of the private roads, which came in 1875 in Bavaria, in 1876 in Saxony, in 1885 in Prussia, in 1889 in Mecklenburg, and in 1896 in Hesse, the union of the German railways which was desirable both for political and economic reasons had been effected to a very considerable extent. This was a marked progress as compared with the loose working agreement of the Verein deutscher Eisenbahnverwaltungen organised in 1847 for the private roads and still in existence.

But the plan of taking over the roads into state ownership was not taken up seriously by the various states until 1871, when Bismarck, the Chancellor of the new German Empire, desired to unite all German railways in one system. His idea was taken up again in 1919, was incorporated in the Weimar Constitution, and was carried out in 1920 by transferring the railways to the ownership of the Reich. The total price paid was 39,065,000,000 marks.

Four years later, however, in 1924, the system was again taken out of the hands of the Reich and converted into an independently administered concern under state ownership, and named the Deutsche Reichsbahn Gesellschaft or German State Railway Company, under the Dawes Plan. At its head is a general manager, at first Rudolf Oeser, and since 1926 Dr. Julius Dörpmüller. The controlling powers of the Reich are vested in the Ministry of Transport. Of the total of about 36,000 miles in Germany, 33,260 miles belong to the Deutsche Reichsbahn Gesellschaft, which, with such a system and with about 685,000 employees, is not only the largest railway system, but also the largest commercial undertaking in the world.

Timber in Rolling Stock Construction

Abstract of a paper by Mr. W. H. Brown, Carriage and Wagon Works Manager, York, L.N.E.R., read at a meeting on February 7 in London of the British Wood Preserving Association

There are few instances in railway rolling stock construction where impregnated timber can be used owing to the odour and contaminating effects of creosote and the majority of impregnating chemicals. Design and construction with special attention to ventilation are consequently the main defences against decay. In the building and repairing of carriages and wagons in a normal year the four British group railways use about 7,600,000 cu. ft. of softwood at an estimated cost of £650,000 and 1,840,000 cu. ft. of hardwood to a value of about £430,000, as well as plywood and veneers in large quantities. In addition a considerable amount of timber is annually required in connection with private owners' wagons. Soft-wood deals used are mostly grown in Scandinavia, and for passenger and covered freight vehicles the timber is naturally matured for not less than twelve months before use, and as some will be required for interior work it is placed in timber drying sheds.

Teak, oak and mahogany are the principal hardwoods used for coaching stock. About four years elapse between the felling of the tree, in the case of teak, and its arrival in an advanced state of seasoning in the railway works. After conversion the teak is stacked in a louvred timber drying

shed for further seasoning. During conversion the temperature of the saw-mill and of the building and paint shop is kept at an even 60 deg. F. to avoid deformation of the timber.

The oak used is almost entirely "English" grown, and as it is particularly liable to deformation it is stacked on a sheltered site in the open; maturing is completed by stacking for fifteen months in a louvred drying shed. Close grained teak timbers are selected for the body side framing and panelling, $\frac{3}{4}$ in. space being allowed where possible between the timber body and steel members of the undercarriage for ventilation. At points of contact with steel underframing a thick coat of lead paint is applied to the timber. Tongued and grooved softwood floor boards are lead painted on both sides and edges before assembling. The cant rails at the top of the side quarters, forming the roof foundation, are generally of pitch pine.

On completion of the body all surface timbers are thoroughly cleaned and prepared for varnishing. To obscure the grain the whole of the teak body exterior is given a priming coat of goldsize. This is all important as being the foundation upon which the preservation of the timber must stand or fall. It tends to kill the oily nature of the teak surface and penetrates the wood, giving a good adhesion surface.

The priming coat when dry is followed by two coats of preparing varnish (the second rubbed in while still wet), surface defects are stopped, two further coats of preparing varnish are applied, and when dry the surface is smoothed with pumice stone and water. Next a coat of varnish is applied to panels carrying lettering, and transfers and lettering are applied. Two coats of preparing varnish are followed by two of finishing varnish, the surface is again smoothed with pumice and water and two coats of finishing varnish are added. The eleven separate coats of varnish form a film, protecting the timber against moisture, wind erosion and general weathering.

For the roof the mild steel carlines, or hoopsticks, receive a coat of protective lead paint, and after the roof boards are fixed the whole roof is given a priming coat of lead colour paint on the outside, and the screwholes are stopped. A coat of thick white lead paint is applied, and while wet canvas in one piece is stretched tightly over and nailed down at the edges. The white lead paint is then worked through the canvas with a smooth board, and when thoroughly dry the outside is given a further four coats of white lead paint.

On completion of the exterior bodies of passenger stock two coats of white lead are applied to the backs of the side panels and the framework. The doors between the outer panels and the inner casings are thoroughly coated with marine glue, applied hot and rubbed into the joints.

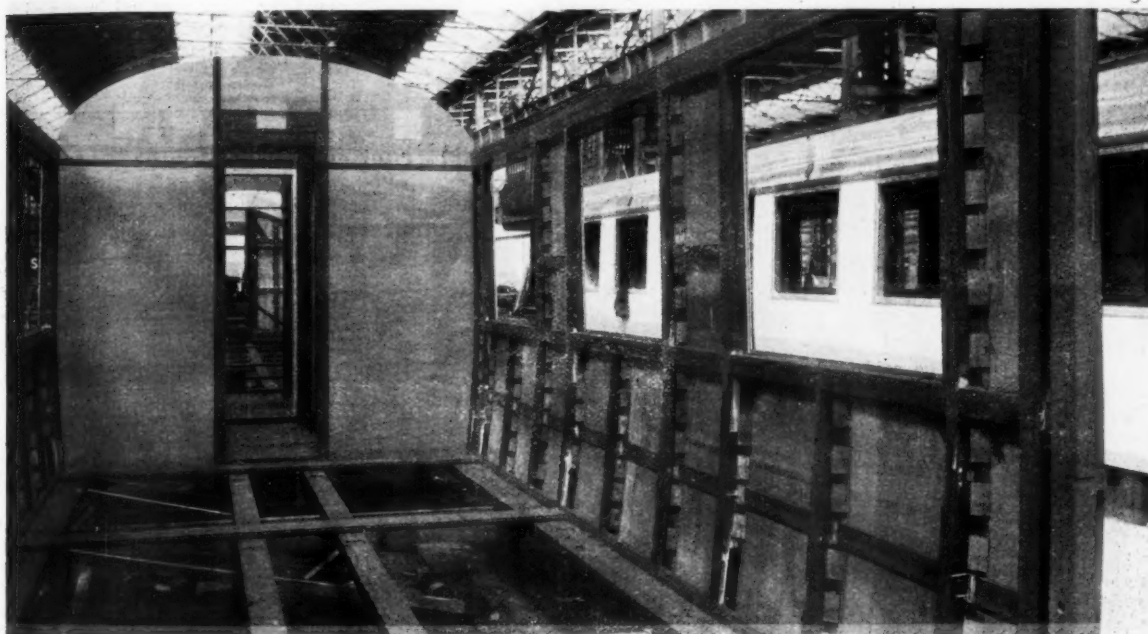
Before fitting the interior panels holes are bored through the framework for ventilation purposes, at points where the structure will not be weakened. For the interior panelling good results and considerably reduced maintenance costs are secured by finishing with nitro-cellulose. An L.N.E.R. first-class dining car decorated by nitro-cellulose five years ago, upon inspection recently appeared as good as when painted, but such results can be obtained only with the best quality nitro-cellulose. In recent years the decoration of ordinary passenger compartments has received careful consideration. One of the results is that a leather cloth of a highly decorative

and mixed with an inert filler. It is insoluble in water, either hot or cold, forms an impermeable film, will not mildew, and offers no attraction to fungoid growth. To this adhesive, the aforementioned leather cloth is anchored, the cellulose side of the cloth forming a waterproof covering to the edges of the plywood panels, and all around the edges cemented. Thus the plywood laminations are efficiently protected against moisture percolation. Particular attention is paid to ventilation of the structure, and air holes were placed in the framework wherever practicable.

For goods vehicles in this country seasoned timber preserved by painting

tain passenger stock were becoming affected by dry rot, but the use of Induroleum, a non-porous cement, as a floor covering has eliminated the trouble.

Owing to the evergrowing cost and shortage of suitable timber, substitutes are being used. For passenger coaches oak members of the undercarriage have been superseded by rolled steel sections, and bodies have also been built of steel. Lightalloy pressings and stampings have replaced timber on account of their weight and strength. Seat ends in open compartments, at one time of timber, are now made in Lightalloy casting. Window frames and numerous other fittings have also been made in



An articulated coach set under construction for the L.N.E.R. tourist trains, showing the large sheets of three-ply panelling fixed to framing

design has been introduced. This* will withstand considerable wear, is not particularly affected by vibration or condensation and is excellent from a hygienic standpoint.

Recently the L.N.E.R. has introduced a series of tourist trains† embodying new features of construction. Instead of the usual clearance between steel frame and timber body the floor members were placed directly on the frame and bedded in thick white-lead paint. Three-plywood sheets, 24 ft. long by 6 ft. 6 in. wide, formed the panelling for the whole of the body sides and ends, both exterior and interior. The faces of all body framing in contact with the panels were given a coat of special adhesive chemical cement. This adhesive is a waterproof alcoholic solution of a resin, plasticised sufficiently to give adequate flexibility,

and ventilation is mostly used. Wagon underframes are generally of oak, coated with thick lead paint at joints, and painted also on the outside and where ironwork is attached. Interiors of ordinary covered wagons and all open wagons are unpainted. The exterior has a coat of lead paint before attachment of metal fittings and is finished with two coats of paint. Apart from refrigerator and insulated vans, which are given one coat of gold-size and two coats of varnish inside, it is not usual to give any special treatment. Cattle wagon floors are of pitch pine, as its resinous nature protects it against animal deposit and disinfectants used for washing the wagon.

In spite of all precautions cases of deterioration sometimes occur such as discoloration of teak side panels due to water getting under the varnish, or timber being imperfectly matured before use. Some few years ago it was noticed that lavatory floors in cer-

this manner. Papier-maché boards have been used for a number of years, and Bakelite is another useful material.

Institution of Railway Signal Engineers.—On p. 117 of our issue of January 19 it was stated that the Council of the Institution of Railway Signal Engineers had awarded the second prize, for the best paper read during the sessions 1932 and 1933, to Mr. G. H. Crook for that on "Automatic Train Control." When that intimation was conveyed to Mr. Crook, he begged to be excused on the ground that his paper actually was based on his report on that subject to the Cairo International Railway Congress. At the meeting of the Institution on February 14 it was announced that the Council had appreciated Mr. Crook's attitude and had awarded the second prize instead to Mr. H. H. Dyer for his paper "The Financial Side of Signalling Economies."

* The reference was to Rexine.

† Fully described and illustrated in THE RAILWAY GAZETTE of July 28, 1933.

Institute of Transport Dinner

The annual dinner of the Institute of Transport took place at the Connaught Rooms in London on February 16, with the President, Mr. William Whitelaw, in the chair. Among those present were:—

Messrs. A. W. Arthurton, E. D. Brant, A. J. Butler, A. L. Castleman, A. R. Cooper, R. G. Davidson, Ashton Davies, G. Cole Deacon, Sir R. Francis Dunnell, Messrs. A. Earle Edwards, W. A. Fiddian, Sidney E. Garcke, W. H. Gaunt, Sir Alexander Gibb, Messrs. A. Winter Gray, H. N. Gresley, T. Bernard Hare, Sir Harold Hartley, Sir Clement D. M. Hindley, Messrs. S. N. Horne, G. E. Woods Humphrey, P. V. Hunter, Com. A. F. Inglefield, Messrs. W. A. Jepson, A. E. Kirkus, Gerald W. E. Loder, F. Lydall, W. J. McAlister, J. McDonnell, Sir H. Osborne Mance, Messrs. E. C. Marston, A. Matheson, Sir Henry P. Maybury, Messrs. Ian C. A. Murray, R. H. Nicholls, Sir David J. Owen, Messrs. P. F. Pike, P. H. Price, I. Buchanan Pritchard, D. Ross-Johnson, F. G. Royal-Dawson, W. Rutherford, C. E. R. Sherrington, H. A. Short, Roger T. Smith, Percy Syder, T. E. Thomas, Rt. Hon. W. J. Thomson, Sir George Wyatt Truscott, Messrs. E. W. Willis, Sir Murrrough J. Wilson, and Mr. W. V. Wood.

Lord Macmillan, in a witty speech, proposed the toast of "The Institute of Transport," and referred to the useful purpose which the institute served in forming a common ground on which those responsible for every form of transport could discuss together their problems. There were, he said, only two main problems before civilisation to-day, those of production and distribution, and it was the latter which had not been finally solved and towards the solution of which the Institute of Transport could make a valuable contribution. Lord Macmillan mentioned the efficient way in which the institute was administered, an example of which was shown by the time table to which everything in connection with the present function had been arranged. He was reminded of the incident during the 1926 strike when a train from Dover deposited its astonished passengers at Waterloo ten minutes before scheduled time. One gratified passenger went forward to offer his congratulations to the driver who, clad in plus fours, replied "it's you who are to be congratulated, I only discovered how to stop the damned thing ten minutes before we reached Waterloo."

Mr. William Whitelaw, responding, referred to the co-operation between various forms of transport which was exemplified in the institute. He was a strong advocate of co-operation, and mentioned the case of a branch line in Scotland which had been closed down, and rightly so, he thought, as the result of the construction of a new road serving the same district over which it was possible to provide a more efficient system of transport for the scattered inhabitants of the district than could be given by the railway. This had come about as the result of the close co-operation between road and rail interests. Sir Joseph Nall proposed the toast of the "Minister of

Transport" and the other guests, and referred to the achievements of the Ministry since its formation and the tasks still remaining to be accomplished, amongst which the most pressing at the present time was that of the safety of the roads. The Minister of Transport would have the best wishes of all the members in his difficult task.

The Hon. Oliver Stanley, Minister of Transport, responding to the toast, referred to the magnitude of the transport problem, which was greater to-day in this country than it had ever been before. In contributing to the solution of the problem his motive might be described in the same words as described the policy of the institute,

namely, to assist and further in all practicable ways the development and improvement of transport in the best interests of the people. The best interests of the people would not be served by rusty rails on the one hand or empty roads on the other, nor by sanguinary battles between those two great forces for the public good, but in a proper co-ordination of the two. Under the Road and Rail Act he had set up a Transport Advisory Council, the functions of which, he thought, would be of the greatest importance. Many of the members of that Council were members also of the Institute of Transport. It would have not only the duty of tendering advice to the Minister, but would provide a common ground for 30 persons, all interested in transport from one angle or another, to discuss the various problems concerning them.

Commercial Practice on Railways

Mr. Ashton Davies, O.B.E., Chief Commercial Manager, L.M.S.R., delivered on Tuesday to the Metropolitan Students of the Institute of Transport a special lecture on the "Application of Modern Commercial Practice to Railways."

Referring to the changed position of the railways under the stress of competition and to the reorganisation of the commercial branches of the L.M.S.R. under one head, Mr. Ashton Davies said a cardinal principle was to secure all possible decentralisation and to give executive power to district officers and local agents. The problem was to secure the right type of man for the railway sales service. Experience and judgment was necessary as well as "push and go," and they had succeeded in organising a body of trustworthy men. They then planned a scientific code of guiding principles of salesmanship which rested on personal contact, mutual confidence and the co-operation of the staff. To measure the result of effort, "station quotas" were fixed on a reasonable basis and everyone was told what contribution to receipts he was expected to secure. This brought a keen team spirit into operation, and as transport was in competition with every other seller of wares for the public money, canvassers and agents had to do their best to interest their customers in the transport business. Provision for training in salesmanship and for expert assistance to district officers had also been made at headquarters. All the employees of the company were regarded as potential salesmen.

Turning to publicity methods, Mr. Davies said there was a radical difference between goods and passenger sales. Goods sales had to be effected chiefly by personal effort and the spoken word; passenger salesmanship mainly by advertising of all kinds. Advertising was of the persuasive and of the announce-

ment types. When a thing was advertised, it is not advertising that was on trial but the saleability of the commodity or service offered. In advertising he claimed that the railways were now definitely ahead of commercial practice.

Research was also of the greatest importance. Trained staffs were continually subjecting the traffic fields, both goods and passenger, to detailed investigation and statistical analysis. Sales research had to watch all public movements from the point of view of possible traffic developments. Business forecasting was also based on sales research. It was comparable with the devising of new lines of merchandise in the commercial world. The creation of new services was part of this activity, but care had to be taken not to take traffic from one service merely to put it into another. Much development had taken place in the sphere of exceptional rates, special contracts and agreed charges, which had now been regularised by legislation after the adverse decision on the Robinson case.

Since the railways were drawn into the competitive transport market, nothing less than a revolution had been achieved in the conduct of their commercial affairs. The ideals of the administrator and the salesman were often in conflict, but mutual confidence and goodwill would resolve the conflict, and the future could be regarded with confidence.

British Standard Specification for Plywood.—The British Standards Institution is preparing a series of specifications for grading commercial plywoods, the first of which, that for birch plywood, has just been issued under No. B.S.S. 531—1934. Copies of this specification may be obtained from the British Standards Institution, 28, Victoria Street, S.W.1, price 2s. 2d., post free.

Novel L.M.S.R. "Personal Contact" Advertising

ASHTON DAVIES, O.B.E.,
Chief Commercial Manager of the
London Midland & Scottish Railway
introduces
J. A. MILLIGAN.



Ask Mr Milligan



J. A. MILLIGAN,
District Passenger
Manager for London,
Euston Station,
London, N.W.1
Telephone 1,
Museum 2900

I want to introduce to you today a man whom I hope a great many of you know already. Mr. Milligan is the District Passenger Manager of the London Midland and Scottish Railway in London.

He is responsible for all LMS passenger business in the London district. Mr. Milligan enjoys a large measure of authority. We believe that the man who lives in the locality knows most about the needs of the locality, so District Officers on the LMS have a great deal of power as well as a great deal of responsibility. In dealing with Mr. Milligan, therefore, you are dealing with a principal and not with a subordinate.

Make him your passenger train transport adviser

I want you to think of Mr. Milligan as your expert on transport: always there to give you information, always at your elbow to advise you about travel or transport. People are inclined to think of a railwayman as a sort of robot that will only answer "Yes" or "No" to a question. It is not true at all. A friend of mine arrived one day recently at a small junction station to make a connection. It was very cold and there was a little time to wait. As he was getting out on to the platform a porter came along and said "Why not stay where you are till the other train comes in? Stay in the carriage where it's warm, and I'll come over and let you know when the train is coming in on the other side."

As my friend said, "That's the stuff!" The porter was giving his mind to the passenger's welfare and that's the foundation of good service. You will find Mr. Milligan and his staff are

full of kindness and courtesy and helpfulness. He will advise you about your own private travel, about your family travel, about your friends' travel, about the travel of the club or the group or the association you belong to. If you have a private journey to take that is not easy to put together, Mr. Milligan and his staff will have it done for you. If you are thinking of getting up a works excursion or a Summer School or a Sales Convention or a Discussion Group or a Federation Congress, Mr. Milligan will tell you the best way to set about it and the best way to go. He will tell you a suitable place, and put you in touch with the people in that place who will look after your group when you get there.

Even before a plan of a conference is formed in your mind, if you are wondering what could be done to bring a group of people together, write to Mr. Milligan. He will be able to make suggestions as to how to get the first few people to form a nucleus. In the same way, if you are thinking it might be a good thing for your business to bring all your representatives up to headquarters for a conference have a talk with Mr. Milligan.

An LMS man, you must remember, sees a hundred different businesses and he gets a knowledge, not only of transport, but of the kind of transport that every business needs.

A word about parcels

Particularly I want you to think of Mr. Milligan if you have parcels to send out regularly in your business. We have screwed up the speed of the service in parcels of late a good deal, and have plans in hand to do a lot more.

We are going to make 1934 a year of occasion for the LMS. New services, new facilities and above all a huge programme of building new corridor carriages for the new passenger traffic that "Summer Tickets" and cheaper travel will bring.

I want you to think of the LMS, not as a body of officials, but as a body of men friendly, helpful and obliging, anxious to do all that can be done to make your travel agreeable and your transport efficient.

ASHTON DAVIES.

ASHTON DAVIES, O.B.E.,
Chief Commercial Manager of the
London Midland & Scottish Railway
introduces
A. L. CASTLEMAN.



Ask Mr Castleman



A. L. CASTLEMAN,
District Goods
Manager for London,
Broad Street Station,
London, E.C.1.
Tel. Bishopsgate
5441.

"Deliver it the day after we get it" is the motto we are trying to live up to.

I suggest to you, therefore, that if you are sending goods otherwise than by rail you should have a word with Mr. Castleman and see if there is anything in this for you.

There might be quite a lot.

A tale of a good deal

If you will listen for a minute I will tell you a little story. Something that happened to me.

I was talking to a friend on the links one Saturday afternoon recently, and seeing he was a little out of spirits I said to him, "What has happened to the friend of my youth? Is it the wood or the iron causes you sadness, or have you been making a long story of a short putt?" "It's both wood and iron," he said; "I've got a report from my Board of Directors that we shall have to replace nineteen of our road vehicles before the end of the financial year and that will knock my profit and loss account sideways. I've been nursing that profit all the year and now I can see it slipping out of my hands."

"Too bad!" said I, "but don't lose heart. The railway is still going strong. Suppose you don't replace them. Suppose you put your stuff on rails instead."

"You can't give me the service, my lad."

"Don't you be too sure of that. If I can beat the service you're getting, will you give me the lot?"

"That's rather a big order. We'll have to have a talk about that."

In the end we did have a talk about it. We sat down with facts and figures and comparative data of every sort and kind, and finally I was able to show a considerable advantage to the firm. We took over the whole of his transport and are doing it to his entire satisfaction.

Make him your transport adviser

Now I can see no reason why that shouldn't be repeated in every district.

Just because some time ago, it may be, you made up your mind to send your goods by road on your own vehicle, don't jump to the conclusion that you should still do that. Things don't stand still, and what was true yesterday is not necessarily true today.

Ask Mr. Castleman to go into it with you. Make him your Transport Adviser. There may be more in it than you think.

ASHTON DAVIES.

L M S

L M S

LONDON MIDLAND & SCOTTISH RAILWAY LONDON MIDLAND & SCOTTISH RAILWAY

Two of a series of advertisements issued by the L.M.S.R. in which Mr. Ashton Davies introduces the District Passenger Manager and the District Goods Manager, and points out the large measure of authority enjoyed by each. The advertisements above refer to the London area, but announcements in similar terms have been published in the other districts. This series follows the original introduction by Sir Josiah Stamp of Mr. Ashton Davies—an advertisement reproduced on page 417 of our issue of March 24, 1933

NOTES AND NEWS

Diesel Users' Coming of Age.—The Diesel Engine Users' Association will hold its annual dinner on Tuesday, February 27, in celebration of its twenty-first anniversary.

Knightsbridge Underground Station.—On Sunday morning, February 18, the reconstructed Knightsbridge tube station of the London Passenger Transport Board was brought into service. A sub-surface circular ticket

library staff and conveyed from the temporary buildings to the new library in a fleet of L.M.S. motor vans.

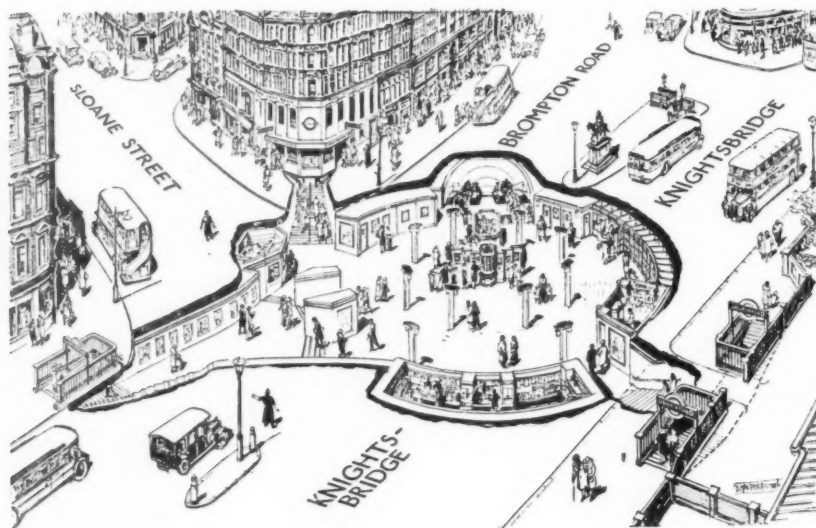
Platform Tickets for Cardiff Station.—The last of the "open" stations on the Great Western Railway in South Wales, that of Cardiff, will be "closed" on Monday next, February 26. Persons who are not actually travellers will no longer be permitted to make use of the platforms free of charge. As has

been the practice at Cardiff on Sundays for some time past, it will be necessary for non-travellers to purchase 1d. platform tickets. This will avoid the necessity for the examination of tickets at Marshfield, Riverside, and Ely.

G.W.R. Station Garages.—The Great Western Railway proposes to construct six lock-up garages opposite the parcels depot at Cardiff General station for the convenience of passengers using the station, and the work of erection will be put in hand at once. The garages may be hired by the day, week, or month.

L.N.E.R. Locomotive and Rolling Stock Orders.—As recorded in our Contracts and Tenders section this week the L.N.E.R. has placed orders with each of two East Coast locomotive building firms for ten 2-6-0 standard K3 class three-cylinder locomotives and tenders, and with two Birmingham rolling stock manufacturers for additional coaches for two further trains of the specially designed tourist and excursion type introduced by the company last summer.

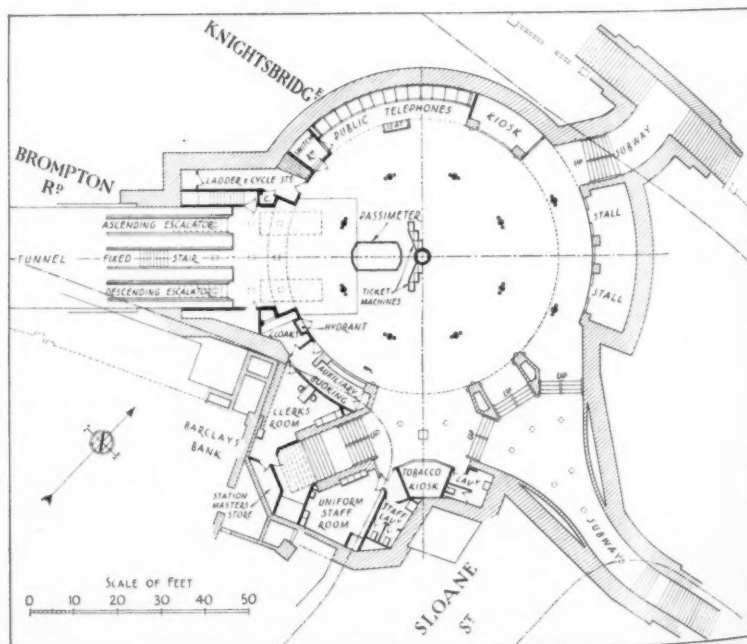
London Transport C Stock.—The London Passenger Transport Board announces that it is unable to make an interim payment on account of interest on its £23,654,240 of C stock. Among the reasons for this postponement are that the facts necessary for arriving at the payments to the main line companies under the pooling scheme have not yet been ascertained. Moreover, the Board is still engaged in absorbing various independent undertakings operating in its area, and the consideration payable for these undertakings may



Perspective of the new Knightsbridge station, from a London Transport advertisement

hall has been provided at the junction of Sloane Street and Knightsbridge, with three separate entrances from the pavement on the south side of Knightsbridge and east and west sides of Sloane Street. Two reversible escalators run direct from the ticket hall to the platforms. A further entrance to the station is being provided at the corner of Hans Crescent, and will be opened early in July, when Brompton Road station will be closed. During the year 1933, 4,500,000 passengers used Knightsbridge station.

Moving 300,000 Books without Closing Library.—A library of 300,000 books and newspapers is being moved into new quarters in Manchester over a period of three to four weeks without closing any part of the library to the public. This task was begun by the L.M.S.R. on Wednesday, February 21 when the first consignment of books was transferred from temporary library buildings and the Commercial Library, Manchester Royal Exchange, to the new Central Library, St. Peter's Square, Manchester. To avoid increasing congestion in the streets and to enable the removal to be effected more quickly it is being carried out at night-time, the books being packed in boxes by the



Booking hall level of the new Knightsbridge underground station, opened on Sunday morning

in some cases involve the issue of further amounts of transport stock. In consequence no interim payment is being made on Metropolitan assented stock.

New L.M.S.R. Halt in the Glasgow District.—On March 1, the L.M.S.R. is to open a new halt, to be known as Mossbank (West), between Corkerhill and Crookston.

Spanish Railway Accident.—The night train from Seville to Madrid and a special football excursion train collided head-on on February 20 near Andujar. Nine persons are reported to have been killed and 30 injured.

New G.W.R. Halt at Green Bank.—The new G.W.R. halt now under construction at Green Bank, between Coalbrookdale and Lightmoor, is to be provided with a combined booking and parcels office.

Beama Annual Dinner.—The annual dinner of the British Electrical and Allied Manufacturers' Association has been arranged for Thursday, May 17, and will be held at the Connaught Rooms, Great Queen Street, London, W.C. The President of the Association, the Rt. Hon. the Earl of Derby, K.G., will preside.

Railways and Aerial Transport.—The four main-line railway companies and Imperial Airways Limited have reached agreement for the formation of a new company with a nominal capital of £50,000 to provide and operate air services in the British Isles and elsewhere and to form connecting links with the services of Imperial Airways. The general lines of the new organisation have also been agreed, but no announcement in regard to particular services can be made for some time as a number of preliminary arrangements are first necessary.

Special L.N.E.R. Excursion for Soldiers' Friends.—To enable friends and relatives of the men belonging to the Northumberland Fusiliers, en route from Jamaica via Southampton to the East, to meet them on their arrival in England, a special L.N.E.R. excursion train, including a restaurant car, will leave Newcastle at 10.15 p.m. on Sunday, February 25, and return from Southampton at 8.57 p.m. the following day; the fare for the 663 miles journey is 21s. This is the first excursion which has been run for such a purpose, and upwards of 320 passengers are expected to make the journey.

Norwich Tramways Purchase.—Under agreements entered into last November, the Eastern Counties Omnibus Co. Ltd. (in which the L.N.E.R. and L.M.S.R. are interested) bought control of the Norwich Electric Tramways Company, financing the purchase largely by means of temporary loans. To refund these the Eastern Counties Company has now issued £200,000 in 5 per cent. cumulative redeemable preference shares of £1 each, at 21s. 3d. a share. There are no debentures outstanding.

The other issued capital consists of £672,069 in £1 ordinary shares, of which 185,663 are owned by Tilling & British Automobile Traction Limited, 163,243 by the L.N.E.R., 22,419 by the L.M.S.R., and 290,041 by United Automobile Services Limited. The Eastern Counties company owns or controls, directly or through subsidiary companies, 620 omnibuses and coaches, and the 44 electric tramcars working in Norwich. It is now proposed to replace the last-named with buses as soon as the necessary powers are secured.

Fatal Collision in Italy.—A head-on collision occurred on February 18 between a railcar and a special steam train three miles from Populonia on the single line between Campiglia and Piombino. The petrol-engined railcar, which was reported to have been travelling at a speed of 75 m.p.h. at the time, caught fire as the result of the bursting of the petrol tank. It is reported that 34 out of the 48 passengers in the railcar lost their lives.

Indian Budget.—Last week the Indian Railway Budget was presented by Sir Joseph Bhole, Member for Commerce and Railways, in the Legislative Assembly, New Delhi. As compared with 1932-33 the deficit is expected to be reduced in 1933-34 by Rs. 2.3 crores and in 1934-35 by Rs. 5 crores, to a figure of Rs. 5½ crores. Allowance has been made to cover the cost of both the heavy earthquake damages and the Hardinge Bridge protection works in these estimates. Sir Joseph led his hearers to understand that leeway in the matter of necessary expenditure during and due to the depression would soon have to be made up and that appreciable savings were expected from job analysis.

Cardiff and the Citrus Fruit Trade.—It is claimed by the Great Western Railway, and with good reason, that not only is the port of Cardiff the centre for economic fruit distribution in Great Britain, but that it is also ideally situated for the importation of citrus fruit from Palestine. And that is why the company has specially compiled and published an attractive brochure, printed in English, Hebrew and Arabic, setting forth various facts relating to its up-to-date methods of handling merchandise which, it thinks, should specially appeal to the fruit-growers and shippers of the Near East. The front cover has a striking design in colour, whilst on the back is a half-page railway map with, underneath, the line: "Ship via Cardiff and G.W.R. route."

Novel L.M.S. Poster.—A century of railway locomotive progress, "from the *Rocket* to *The Princess Royal*," is illustrated in a striking new L.M.S. poster by C. H. Fairhurst. The design features Mr. Stanier's new Pacific, *The Princess Royal*, against a background composed of outline drawings of famous locomotive types of the past century, with the applicable dates of each. The

types illustrated include the *Rocket* (Liverpool and Manchester Railway, 1830); *Cornwall* (L.N.W. Railway, built at Crewe, 1847); *Caledonian Railway 4-2-2 locomotive No. 123* (1886); *Queen Empress* (L.N.W. Railway, built at Crewe, 1893); *Midland Compound 4-4-0 locomotive* (built Derby, 1905); "*Claughton*" six-coupled express locomotive (L.N.W. Railway, built Crewe, 1913); and a modified *Royal Scot* (L.M.S., 1927). Although these types cover a period of over 100 years, all are either still in active service or preserved as historic relics, with the exception of *Queen Empress*, which was exhibited at the Chicago Exposition of 1893.

American High-Speed Streamlined Train.—The light-weight high-speed passenger train built for the Union Pacific Railroad, and described with illustrations on page 805 of THE RAILWAY GAZETTE for June 16 last, has been completed and is making an exhibition tour of the principal towns served by the Union Pacific. This system has ordered a second train of six articulated cars to be driven by a 900-h.p., 12 cylinder, V-type diesel engine. The composition of the train will include the power car, a mail and baggage car, three Pullman sleeping cars, a composite coach, and an observation buffet car. Like the first, it will be of aluminium construction and will be air-conditioned.

Dogs in Railway Service.—Some dogs which were brought over to Europe from Alaska several years ago, for film purposes, are now finding useful employment with a railway company. This is the Jungfrau Railway of Switzerland, whose Jungfraujoch terminus is 11,342 ft. above sea-level. In company with a team of "huskies" from Siberia and some Greenland dogs, these animals, 17 in all, are used for the purpose of giving sleigh rides over the Jungfraufirn, or glacier—which is here quite free from crevasses—to the visitors who come up to Jungfraujoch by rail in such large numbers during the summer. In the winter time they find further employment in re-victualling the railway officials at this immense altitude. The photograph reproduced was taken at about 11,500 ft. above sea-level, in mid-July.

Big Pennsylvania Programme.—With payment of the first instalment of \$77,000,000 provided by the U.S.A. Public Works Administration, the Pennsylvania Railroad is to push forward the electrification of the Wilmington/Washington section, already 25 per cent. complete, in order that through electric working between New York and Washington may be inaugurated early in 1935. The work to be carried out with the Government's aid includes the conversion of 108 route miles, seven large freight terminals, and several branches and connecting lines; the construction of 101 electric locomotives (59 for freight, 28 for passenger, and 14 for shunting service) and 23

multiple-unit cars; the construction of 7,000 all-steel freight cars. Out of its own resources, the Pennsylvania Railroad is financing the work of widening the Baltimore tunnel and improving the stations at Newark and Philadelphia. It is estimated that the complete programme will provide a year's work for almost 25,000 men. Electric working of passenger trains between New York and Philadelphia was begun in January, 1933.

Forthcoming Meetings

- Feb. 23 (Fri.).—**London Midland & Scottish Railway Company** (Ordinary General), Friends House, Euston Road, N.W., at 11.30 a.m.
- Feb. 23 (Fri.).—**Mersey Railway Company** (Ordinary General), Winchester House, Old Broad Street, E.C.2, at 12 noon.
- Feb. 27 (Tues.).—**Belfast & County Down Railway** (Annual General), Company's Terminus, Queen's Quay, Belfast, at 11.30 a.m.

Feb. 27 (Tues.).—**London Midland & Scottish Railway Company** (Special General), Euston Station, N.W.1, at 12 noon.

Feb. 28 (Wed.).—**Great Northern Railway Company (I.)** (Ordinary Annual General), Grosvenor Minor Hall, Gleggall Street, Belfast, at 12.30 p.m.

Feb. 28 (Wed.).—**Great Western Railway Company** (Annual General), Paddington Station, W.2, at 11.30 a.m.

Mar. 1 (Thurs.).—**Southern Railway Company** (Annual General), Southern House, Cannon Street Station, E.C., at 11.30 a.m.; followed by Special General (Wharnccliffe) Meeting at 12.30 p.m.

Mar. 2 (Fri.).—**London & North Eastern Railway Company** (Annual General), Wharnccliffe Rooms, Hotel Great Central, Marylebone, N.W., at 2 p.m.

Mar. 9 (Fri.).—**Great Southern Railways Company** (Ordinary General), Gresham Hotel, 20-22, Upper O'Connell Street, Dublin, C.8, at 2 p.m.

Mar. 27 (Tues.).—**Ottoman Railway from Smyrna to Aidin** (Half-Yearly), Winchester House, Old Broad Street, E.C.2, at 11 a.m.

British and Irish Railway Stocks and Shares

Stocks	Highest 1933	Lowest 1933	Prices	
			Feb. 21 1934	Rise/ Fall
G.W.R.				
Cons. Ord. ...	55½	31	58	+1
5% Con. Prefce. ...	109½	69½	111½	—
5% Red. Pref. (1950) ...	109¼	87½	112½	—
4% Deb. ...	108½	99¼	106	—
4½% Deb. ...	108	100½	110½	—
4½% Deb. ...	116	106	117½	—
5% Deb. ...	128	117¼	128½	—
2½% Deb. ...	65	60	64½	—
5% Rt. Charge ...	124	111½	125½	—
5% Cons. Guar. ...	122	103	124½	—
L.M.S.R.				
Ord. ...	297½	12½	25	—½
4% Prefce. (1923) ...	51	17	51½	—½
4% Prefce. ...	72	33¼	78	—
5% Red. Prf. (1955) ...	93	47¼	97½	—
4% Deb. ...	103¼	89½	101½	—
5% Red. Deb. (1952) ...	114	105	113½	—
4% Guar. ...	97¼	68½	97½	—
L.N.E.R.				
5% Pref. Ord. ...	22½	7¾	19½	—
Def. Ord. ...	10¾	4½	9½	—
4% First Prefce. ...	65½	19½	65	—½
4% Second Prefce. ...	40½	12¼	37	—½
5% Red. Pref. (1955) ...	83½	27	83	+½
4% First Guar. ...	94½	58¼	93	—½
4% Second Guar. ...	89¼	48	88	—
3% Deb. ...	77	60¼	75½	—
4% Deb. ...	102½	80	100½	—
5% Red. Deb. (1947) ...	112	102½	111	—
4½% Sinking Fund Red. Deb.	107½	98¾	106½	—
SOUTHERN				
Pref. Ord. ...	71	27¾	79	+4
Def. Ord. ...	24½	9½	23½	+2
5% Prefce. ...	107½	74	112	+1
5% Red. Pref. (1964) ...	107¾	78½	112½	—
5% Guar. Prefce. ...	124¼	102¾	123½	+1
5% Red. Guar. Pref. (1957) ...	115½	103½	114½	—½
4% Deb. ...	107½	96¾	106	—
5% Deb. ...	126½	114¼	127½	—
4% Red. Deb. 1962-67	107¼	100	106½	—
BELFAST & C.D.				
Ord. ...	6	4	6	—
FORTH BRIDGE				
4% Deb. ...	99½	95½	100½	—
4% Guar. ...	98½	94	100½	—
G. NORTHERN (IRELAND)				
Ord. ...	7½	3½	5	—
G. SOUTHERN (IRELAND)				
Ord. ...	28	16	24½	—
Prefce. ...	24	12½	20	+½
Guar. ...	42	16¾	43½	+½
Deb. ...	60	30½	62	+½
L.P.T.B.				
4½% "A" ...	117½	112	116	—
5% "A" ...	127¼	119¼	126	—
4½% "T.F.A." ...	111¼	106	109½	—
5% "B" ...	122½	114	119	—
5% "C" ...	86¾	74½	83	—½
MERSEY				
Ord. ...	16¼	5	13	—
4% Perp. Deb. ...	83	63½	85½	—
3% Perp. Deb. ...	62	51	63½	—
3% Perp. Prefce. ...	50½	27	49½	—

British and Irish Railway Traffic Returns

GREAT BRITAIN	Totals for 7th Week			Totals to Date		
	1934	1933	Inc. or Dec.	1934	1933	Inc. or Dec.
L.M.S.R. (6,941½ mls.)						
Passenger-train traffic ...	371,000	362,000	+ 9,000	2,494,000	2,430,000	+ 64,000
Merchandise, &c. ...	419,000	409,000	+ 40,000	3,029,000	2,640,000	+ 389,000
Coal and coke ...	273,000	262,000	+ 11,000	1,910,000	1,881,000	+ 29,000
Goods-train traffic ...	722,000	671,000	+ 51,000	4,939,000	4,521,000	+ 418,000
Total receipts ...	1,093,000	1,033,000	+ 60,000	7,433,000	6,951,000	+ 482,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic ...	242,000	239,000	+ 3,000	1,641,000	1,627,000	+ 14,000
Merchandise, &c. ...	321,000	266,000	+ 55,000	2,186,000	1,820,000	+ 366,000
Coal and coke ...	260,000	241,000	+ 19,000	1,756,000	1,647,000	+ 109,000
Goods-train traffic ...	581,000	507,000	+ 74,000	3,942,000	3,467,000	+ 475,000
Total receipts ...	823,000	746,000	+ 77,000	5,583,000	5,094,000	+ 489,000
G.W.R. (3,750 mls.)						
Passenger-train traffic ...	147,000	147,000	—	1,053,000	1,052,000	+ 1,000
Merchandise, &c. ...	180,000	161,000	+ 19,000	1,204,000	1,053,000	+ 151,000
Coal and coke ...	114,000	109,000	+ 5,000	785,000	779,000	+ 6,000
Goods-train traffic ...	294,000	270,000	+ 24,000	1,989,000	1,832,000	+ 157,000
Total receipts ...	441,000	417,000	+ 24,000	3,042,000	2,884,000	+ 158,000
S.R. (2,177 mls.)						
Passenger-train traffic ...	228,000	223,000	+ 5,000	1,602,000	1,567,000	+ 35,000
Merchandise, &c. ...	60,000	58,000	+ 2,000	402,500	371,500	+ 31,000
Coal and coke ...	39,000	37,000	+ 2,000	258,500	253,500	+ 5,000
Goods-train traffic ...	99,000	95,000	+ 4,000	661,000	625,000	+ 36,000
Total receipts ...	327,000	318,000	+ 9,000	2,263,000	2,192,000	+ 71,000
Liverpool Overhead (6½ mls.)						
Mersey (4½ mls.) ...	4,230	3,793	+ 437	30,011	27,870	+ 2,141
*London Passenger Transport Board ...	496,600	—	—	16,379,400	—	—
IRELAND						
Belfast & C. D. pass. (80 mls.) ...	1,741	1,681	+ 60	12,520	12,363	+ 157
" " goods ...	523	481	+ 42	3,611	3,439	+ 172
" " total ...	2,264	2,162	+ 102	16,131	15,802	+ 329
Great Northern (562 mls.) pass. ...	7,300	850	+ 6,450	49,900	36,800	+ 13,100
" " goods ...	7,600	250	+ 7,350	52,650	38,400	+ 14,250
" " total ...	14,900	1,100	+ 13,800	102,550	75,200	+ 27,350
Great Southern (2,158 mls.) pass. ...	18,338	16,584	+ 1,754	125,355	122,134	+ 3,221
" " goods ...	31,915	30,077	+ 1,838	215,275	197,836	+ 17,439
" " total ...	50,253	46,661	+ 3,592	340,630	319,970	+ 20,660

* 33rd Week.

* ex-dividend.

CONTRACTS AND TENDERS

Following the L.N.E.R. Company's recent call for tenders for K3 class standard three-cylinder 2-6-0 tender locomotives, orders have now been placed for 20. Ten are to be constructed by Robert Stephenson & Co. Ltd., Darlington, and ten by Sir W. G. Armstrong Whitworth & Co. (Engineers) Ltd., Newcastle-on-Tyne.

The Voith fluid torque converter will now be manufactured in this country as a result of arrangements just concluded between J. M. Voith Maschinenfabrik, Neidenheim, and the Hydraulic Coupling & Engineering Co. Ltd., Isleworth, Middlesex, which now owns the British manufacturing rights. The British-made converter will be known as the Voith-Sinclair Turbo-Converter. A description is given in the Diesel Railway Traction Supplement, published with this issue.

In view of the announcement by the Railway Companies' Association that the four main-line railways and Imperial Airways Limited have reached agreement for the formation of a new company with a nominal capital of £50,000 to provide and operate air services in the British Isles and elsewhere and to form connecting links with Imperial Airways services, it is probable that orders for aircraft will shortly be placed for delivery in time for the summer holiday traffic.

Following the L.N.E.R. Company's recent call for tenders for the construction of coaches to be made up into tourist and excursion trains similar to those placed in service on the L.N.E.R. in 1933 and described and illustrated in THE RAILWAY GAZETTE for July 28, 1933, orders have now been placed as follow:—The Metropolitan-Cammell Carriage, Wagon & Finance Co. Ltd.: Eight twin articulated third-class vestibuled coaches; The Birmingham Railway Carriage & Wagon Co. Ltd.: Four third-class open carriages with brake compartments, and four buffet cars. These coaches are required for urgent delivery for the summer traffic. They will be assembled to form two trains, each providing accommodation for 600 passengers.

William Boby & Co. Ltd. has secured an order from the L.M.S.R. for a locomotive water-softening plant of 10,000 galls./hrly. capacity to be installed at Bath.

Heatly & Gresham Limited, Calcutta, has secured an order from the Government of India, Indian Stores Department, New Delhi, for five sets of Pritchett & Gold and E.P.S. Co.'s lead acid batteries.

The Chloride Electrical Storage Co. Ltd., Bombay, has received an order from the Government of India, Indian Stores Department, New Delhi, for five sets of lead acid batteries.

Nasmyth Wilson & Co. Ltd. has secured an order from the Crown Agents for the Colonies for a 4-8-2 type tank shunting locomotive for the Jamaica Government Railways. The locomotive is designed to haul 100 tons and to operate generally at speeds ranging from 6 to 21 m.p.h.

The Secretary, Stores Purchase Committee, Government of Mysore, Bangalore, invites tenders, receivable by April 30, for 10 2-ft. 6-in. gauge bogie trucks for the Mysore Railways through the consulting engineers, Messrs. Rendel, Palmer and Tritton, 55, Broadway, Westminster, S.W.1.

The Agent, Eastern Bengal Railway, Calcutta, invites tenders, receivable by March 14, for the supply of 12K, 17P and 18R class locomotive boilers and superheater conversion sets for 1934-35 requirements.

The Chief Controller of Stores, Indian Stores Department, (Engineering Section), New Delhi, invites tenders, receivable by March 22, for the supply of distribution and transmission line materials for the East Indian and Eastern Bengal Railways and for the supply of canvas hose for the Indian State Railways. Tenders are also invited, receivable by April 3, for the supply of india-rubber hose for the Indian State Railways.

C. H. Johnson & Sons Limited has secured an order from the Buenos Ayres Western Railway on behalf of the Buenos Ayres Midland Railway for two portable coal elevators for loading coal on to locomotive tenders.

The Stanton Iron Works Co. Ltd. has placed an order for 1,000 wagons of 12-tons capacity among the following firms:—Metropolitan-Cammell Carriage, Wagon & Finance Co. Ltd.; S. J. Claye Limited; Birmingham Railway Carriage & Wagon Co. Ltd.; G. R. Turner Limited; and Charles Roberts & Co. Ltd.

Frank How & Co. Ltd. has recently been accorded a large contract for the supply of cylinder oil to the Egyptian

State Railways. This oil will be manufactured entirely at the company's works at Stratford.

The Egyptian State Railways Administration has recently placed orders as follow:—

Metropolitan-Vickers Electrical Export Co. Ltd.: transformers.
Metal Traders Limited: antimony.
Imperial Chemical Industries: carbide of calcium.
Dr. Cassirer & Co. A.G. and Kabel und Gummiwerke: lead covered cable.
Thos. Hinshelwood & Co. Ltd.: boiled and raw linseed oils.

D. Wickham & Co. Ltd. has recently received orders for petrol-driven railcars and trailers as follow:—

Thirty motor trolleys and fourteen trailers for permanent-way maintenance work, for the L.M.S.R.
Two passenger car chassis, for the Cyprus Government Railway, through the Crown Agents for the Colonies.
One four-seat inspection railcar for the Jamaica Government Railway, through the Crown Agents for the Colonies.

Tenders are invited by the Egyptian State Railways Administration as follow:—

Receivable at the General Management, Cairo Station, on the dates named:—

80-125 metrical tons of bolts and nuts for fishplates (March 20).
20-175 metrical tons of steel fishplates and angle stops (April 4).
190-400 metrical tons of saddles for rails (April 11).
700-900 metrical tons of screw spikes for track (April 17).
1,300-2,900 metrical tons of flat bottomed rails (May 2).
5½ metrical tons of cylinder oil and 20 metrical tons of engine oil for steam railcars (April 3).
58 steel solid crossings (April 14).
Internal-combustion engine railcars (March 31).
Motor buses and chassis (March 17).
Ten boilers for auxiliary railway engines (April 12).
450 carriage and wagon tyres (March 14).
Materials and works connected with the construction of a railway bridge over the Sahel Sofl Canal near Sherbin and comprising approximately 100 m.3 reinforced concrete, 135 m.2 plain concrete, 45 tonnes rolled steel joists, 100 m.3 cemented pitchings and 140 m.2 cast asphalt (April 2).
300 tons of pig iron (A), 275 tons (B), and 85 tons best hematite (April 10).

Receivable at the office of the Superintendent of Stores, Saptieh, Cairo, on the dates named:—

110 engine and tender tyres (April 3).
2,000 kilos. engine oil (March 6).
One private automatic branch exchange, three exchange lines, 10 extensions (February 27).
Receivable at the Chief Inspecting Engineers' Office, 41, Tothill Street, London, S.W.1 on the dates named:—
400 kilos. iron chains ½ in., and 1,500 kilos. ¾ in.
Four metal rectifiers (date to be fixed).
Signalling materials (March 6).

Guest Keen & Nettlefolds Limited has received an order for 15,500 mild steel rail clips for 100-lb. B.S. (R.) rails on cast steel chairs for the Buenos Ayres Great Southern Railway.

Export of Railway Material from the United Kingdom in January

	Jan. 1934.	Jan. 1933.
Locomotives, rail	25,429	48,728
Carriages and wagons	58,102	42,673
Rails, steel	46,822	30,695
Wheels, sleepers, fishplates and miscellaneous materials	60,854	45,478

Locomotive and rail exports included in the following:—

	Locomotives.		Rails.	
	Jan. 1934.	Jan. 1933.	Jan. 1934.	Jan. 1933.
Argentina	—	728	4,786	—
Union of South Africa	—	—	24,303	5,837
British India	—	1,260	8,802	9,358

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table of freight and passenger traffic figures for November, 1933, as compared with the corresponding period in 1932, compiled from the Ministry of Transport Statement No. 168

Description	Great Britain*	Great Western	London & North Eastern	London Midland & Scottish	Southern
PASSENGER TRAIN TRAFFIC—					
Number of passenger journeys (excluding season-ticket holders)	90,457,162	6,582,580	12,751,797	20,726,335	15,621,544
Increase (+) or decrease (—)	+ 2,934,386	+ 122,279	+ 655,123	+ 1,084,283	+ 615,427
Passenger receipts (excluding season-ticket holders)	£2,997,437	£387,352	£580,622	£891,320	£637,642
Increase (+) or decrease (—)	+ £29,407	— £2,882	+ £5,145	+ £2,237	+ £15,925
Season-ticket receipts	£696,476	£44,591	£121,904	£195,720	£210,650
Increase (+) or decrease (—)	— £7,180	— £2,746	— £7,218	— £4,282	+ £625
Parcels and miscellaneous traffic receipts (excluding parcels post)	£1,073,179	£192,959	£319,088	£408,283	£125,230
Increase (+) or decrease (—)	+ £48,795	+ £5,865	+ £20,632	+ £18,100	+ £3,534
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	22,203,643	5,091,697	10,425,380	10,093,047	1,407,507
Increase (+) or decrease (—)	+ 1,283,788	+ 228,642	+ 867,503	+ 461,921	+ 98,238
Net ton-miles (excluding free-hauled)	1,239,930,656	221,235,233	429,376,674	495,897,609	57,330,868
Increase (+) or decrease (—)	+ 104,176,557	+ 18,055,823	+ 47,177,434	+ 31,514,292	+ 3,382,808
Average length of haul (miles) (excluding free-hauled)	55.84	43.45	41.19	49.13	40.73
Increase (+) or decrease (—)	+ 1.55	+ 1.67	+ 1.20	+ 0.91	+ 0.47
Freight traffic receipts	£7,101,593	£1,173,000	£2,413,000	£2,878,000	£411,283
Increase (+) or decrease (—)	+ £526,237	+ £89,000	+ £247,500	+ £156,000	+ £18,533
Receipts per ton-mile	1.375d.	1.27d.	1.35d.	1.39d.	1.72d.
Increase (+) or decrease (—)	— 0.014d.	— 0.01d.	— 0.01d.	— 0.01d.	— 0.03d.
Freight train-loads—					
Average train-load (tons)	129.57	134.76	137.54	125.51	108.39
Increase (+) or decrease (—)	+ 5.05	+ 6.54	+ 6.45	+ 3.19	+ 3.08
Net ton-miles—					
Per train engine-hour	1,017.18	1,080.31	1,061.51	987.39	867.21
Increase (+) or decrease (—)	+ 8.17	+ 43.91	+ 24.09	+ 23.24	+ 22.59
Per shunting-hour	866.12	783.29	950.66	894.27	588.66
Per total engine-hour	467.79	454.07	501.52	469.26	350.64
Net ton-miles per route-mile per working day	2.705	2.591	3.126	3.126	1.88
Increase (+) or decrease (—)	+ 225	+ 211	+ 318	+ 202	+ 72
Wagon-miles. Total	354,007,446	61,886,886	123,717,932	148,407,343	17,437,039
Increase (+) or decrease (—)	+ 23,402,062	+ 3,665,473	+ 10,870,547	+ 7,699,597	+ 717,399
Percentage of loaded to total	67.36	68.42	64.96	69.02	67.03
Wagons per train—					
Total	34.95	35.02	35.54	35.03	31.69
Increase (+) or decrease (—)	+ 0.76	+ 0.82	+ 0.82	+ 0.70	+ 0.33
Loaded	23.54	23.96	24.18	24.18	21.24
Empty	11.41	11.06	12.45	10.85	10.45
Train-miles. Coaching—					
Per train-hour	15.06	13.83	14.10	14.54	17.62
Per engine-hour	12.07	11.05	11.04	11.05	14.42
Train-miles. Freight—					
Per train-hour	9.17	9.60	8.98	9.14	9.79
Per engine-hour	3.61	3.38	3.69	3.73	3.18
Engine-miles. Total	43,979,860	6,907,423	12,234,987	16,123,291	5,803,185
Increase (+) or decrease (—)	+ 1,481,427	+ 160,622	+ 487,127	+ 426,363	+ 233,269
Mileage run by engines. Total train-miles—					
Coaching	21,417,479	2,924,169	4,872,845	6,737,173	4,216,145
Freight	10,129,555	1,767,102	3,481,242	4,236,786	550,275
Engine-hours in traffic. Total	4,776,006	812,981	1,451,293	1,829,745	480,445
Increase (+) or decrease (—)	+ 178,704	+ 17,755	+ 69,824	+ 75,124	+ 6,335
Shunting miles per 100 train-miles—					
Coaching	7.63	6.96	6.52	8.64	8.13
Freight	74.85	86.03	71.15	69.79	96.85

* All standard-gauge railways

Passenger Traffic Statistics: Number of Journeys, Receipts, and Receipts per Journey (excluding Season-Ticket Holders)—November, 1933

Subject	Great Britain	Great Western	London & North Eastern	London Midland & Scottish	Southern	Cheshire Lines Committee	Liverpool Overhead	London Passenger Transport Board†	Mersey
Full fares—									
Passenger journeys	29,695,301	659,054	1,164,863	1,589,167	2,470,091	25,683	145,037	22,787,315	91,685
Gross receipts	£783,343	£65,228	£109,407	£122,182	£151,802	£3,180	£1,562	£313,495	£1,624
Receipts per passenger journey	6.33d.	23.75d.	22.54d.	18.45d.	14.75d.	29.72d.	2.58d.	3.30d.	4.25d.
Reduced fares—									
Excursion and week-end—									
Passenger journeys	32,663,237	3,684,520	7,356,589	11,324,867	7,377,302	359,754	102,336	936,598	610,226
Gross receipts	£1,641,514	£259,252	£364,662	£591,189	£352,598	£19,122	£773	£19,940	£8,893
Receipts per passenger journey	12.06d.	16.89d.	11.90d.	12.53d.	11.47d.	12.76d.	1.81d.	5.11d.	3.50d.
Workmen—									
Passenger journeys	24,698,770	1,818,399	3,359,770	6,787,370	5,162,502	232,820	212,096	6,054,572	190,300
Gross receipts	£353,585	£26,275	£53,187	£106,658	£83,628	£3,969	£1,722	£66,045	£1,737
Receipts per passenger journey	3.44d.	3.47d.	3.80d.	3.77d.	3.89d.	4.09d.	1.95d.	2.62d.	2.19d.
Other descriptions—									
Passenger journeys	3,398,868	420,607	870,405	1,024,341	611,429	33,124	1,695	362,078	10,480
Gross receipts	£217,762	£36,597	£53,099	£70,563	£48,383	£2,444	£7	£2,988	£129
Receipts per passenger journey	15.38d.	20.88d.	14.64d.	16.53d.	19.38d.	17.71d.	0.99d.	1.98d.	2.95d.
Total—									
Passenger journeys	90,457,162	6,582,580	12,751,797	20,726,335	15,621,544	651,387	461,164	30,140,563	902,701
Gross receipts	£2,997,437	£387,352	£580,622	£891,320	£637,642	£28,722	£4,064	£402,468	£12,383
Receipts per passenger journey	7.95d.	14.12d.	10.93d.	10.32d.	9.80d.	10.58d.	2.11d.	3.20d.	3.29d.

† Includes passengers originating on the railway undertakings, and on the Whitechapel & Bow Joint Railway

OFFICIAL NOTICES

London Midland & Scottish Railway Company.

NOTICE is hereby given that a Special General Meeting of the London Midland & Scottish Railway Company will in compliance with the Standing Orders of Parliament be held at Euston Station, London, N.W.1, on Tuesday, the 27th day of February, 1934, at twelve o'clock noon precisely for the purpose of considering and if so determined of approving the undermentioned Bill and Provisional Order, namely:—

BILL PROMOTED BY THE COMPANY.
DEPOSITED IN PARLIAMENT.

London Midland & Scottish Railway Bill.

A Bill to empower the London Midland & Scottish Railway Company to construct a railway and to acquire lands; and for other purposes.

PROVISIONAL ORDER PROMOTED
BY THE COMPANY.
DEPOSITED WITH THE SCOTTISH
OFFICE.

London Midland & Scottish Railway Provisional Order.

A Provisional Order to authorise the London Midland & Scottish Railway Company to acquire lands in Scotland; to extend the time for the completion of certain authorised railways and works and for the purchase of lands; and for other purposes.

JOSIAH CHARLES STAMP,
Chairman.

OWEN GLYNNE ROBERTS,
Secretary.

Euston Station,
London, N.W.1.
12th February, 1934.

Crown Agents for the Colonies.
Colonial Government Appointments.

APPLICATIONS from qualified candidates are invited for the following post:—

M/3275. SIGNAL ENGINEER required for the Way and Works Department, Government Railway, Ceylon, for a term of 5 years only. No prospect of employment beyond this initial term can be held out. Salary £840, rising to £960 per annum by annual increments of £30 payable in rupees at the fixed rate of fifteen rupees (Rs. 15s.) to the pound (£) sterling. A temporary levy of 10 per cent. on salaries is at present in force. Rent allowance paid if quarters not available. Free passages.

Candidates, not less than 32 years of age, should be Members or Associate Members of the Institution of Mechanical Engineers and also Members of the Institution of Electrical Engineers. They must possess considerable British Railway experience in the preparation of schemes and in the carrying out of works; which should include experience in Electrical Signalling, e.g., Lock and Block, Colour, Light Track Circuiting, &c. The person engaged will be required to design and direct the erection of signalling installations and to estimate the costs of same; be responsible for the proper maintenance of existing appliances, to organise and control a fairly large staff of subordinate officers and workmen.

Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/3275.

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and Railway Year Book

39th Annual Edition, 1933-34.

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OFFICIAL ADVERTISEMENTS.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is noon on Thursday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

Changes in the Engineer's Department, North
Eastern Area, L.N.E.R.

In January, 1931, the London & North Eastern Railway decided to reduce the number of Engineer's Districts in the North Eastern Area from six to five. This change was effected by placing the old Northumberland District under the control of Mr. F. E. Harrison, District Engineer, Newcastle. The company has now decided to make a further reduction in the number of district headquarters, which will in future be allocated at Newcastle, Darlington, York, and Hull. The post of District Engineer at Bishop Auckland, from which Mr. W. D. Rudgard retired last year, will not be filled, and the work previously controlled from that centre has been divided between the Newcastle and Darlington districts. At the same time a few minor adjustments have been made in the boundaries of the York and Hull districts. One result of this rearrangement is to bring the Engineer's Districts more closely in line with those supervised by the District Traffic Officers. Two important appointments in this connection are announced in Personal columns. The post of Assistant Engineer, North Eastern Area, has been vacant since Mr. H. J. Rudgard retired at the end of 1931. It has now been decided to appoint Mr. F. E. Harrison, District Engineer, Newcastle, to this position, and he will shortly take up duty under Mr. J. Miller at York. Mr. Harrison

belongs to a family which has played a great part in the engineering history of the north of England, being a son of the late Mr. C. A. Harrison. Mr. F. E. Harrison himself joined the service of the old North Eastern Railway in 1906. After being some time in charge of the Northumberland district he became District Engineer at New-

castle in 1913. Mr. Harrison will be succeeded at Newcastle by Mr. H. Hills, who is at present Assistant to the Engineer (Permanent Way and Materials). Mr. Hills has had a varied experience, both in the District Engineer's office at York and in the office of the Engineer for the North Eastern Area. He was appointed to his present position in 1928 and is well equipped for taking charge of an important section of railway, which has special features such as the bridges over the Tyne and the Tyneside electrified lines.

Forthcoming Events

- Feb. 23 (Fri.).—L.N.E.R. (King's Cross) Literary Society, at Queen's Hall, Langham Place, London, W.1, 7.30 p.m. Smoking Concert.
- Institution of Locomotive Engineers, at the Trocadero Restaurant, London, 6.30 for 7 p.m. Annual Dinner.
- Railway Club, at Royal Scottish Corporation Hall, Fetter Lane, E.C.4, 7.30 p.m. Annual General Meeting. "Plymouth and Dartmoor Railway," by Mr. Kenneth Brown.
- Railway Correspondence and Travel Society, at Pinoli's Restaurant, 17, Wardour Street, London, W.1, 7.30 p.m. Annual Dinner.
- Feb. 26 (Mon.).—City of Birmingham Commercial College, 7.30 p.m. "Selling Transport," by Mr. Ashton Davies.
- Engineers' German Circle, at Inst. of Mechanical Engineers, Storey's Gate, London, S.W.1, 6 p.m. "Fast Railcars on the German State Railways" and "With the Flying Hamburger from Hamburg to Berlin," by a Technical Expert of the German State Railways.
- Institution of Mechanical Engineers, Storey's Gate, London, S.W.1. Visit to British Industries Fair, Birmingham.
- L.M.S.R. (London) District Goods Manager's

Smoking Concert, at Queen's Hall, Langham Place, W.1.

- Feb. 27 (Tues.).—Diesel Engine Users' Association, at Pagani's Restaurant, 42-48, Great Portland Street, London, W.1, 7 for 7.30 p.m. Annual Dinner.
- Feb. 28 (Wed.).—L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Inst., 7.30 p.m. "Colour Light Signalling," by Mr. A. E. Tattersall.
- Farrington Ward Club, at Arderton's Hotel, Fleet Street, London, E.C.4, 7 p.m. "The Road and Rail Traffic Act, 1933—As it Affects Commercial Motor Users," by Mr. F. G. Bristow, C.B.E.
- Mar. 1 (Thurs.).—Permanent Way Institution (Brighton), in Locomotive Mess Room, New England Street, 7 p.m. "Rails and Tyres," by Mr. E. Treacher.
- Mar. 2 (Fri.).—Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 7 p.m. Informal Meeting.
- Stephenson Locomotive Society (Scottish), at Cambridge House, Edinburgh, 7 p.m. "The Further North Section of the Highland Railway," by Mr. C. S. Mackenzie.
- Mar. 3 (Sat.).—Locomotivemen's Craft Guild (London), at Borough Polytechnic Inst., S.E.1, 6.30 p.m. "Exhaust Injectors," by Mr. H. H. Basford.

Railway Share Market

The stock and share markets have been firm. Under the encouraging influence of the reports and accounts for the past year Home railway stocks have displayed greater activity than has been shown in this section of markets for a considerable period. The most buoyant stock has probably been the preferred ordinary stock of the Southern Railway, which rose to within a fraction of 80 on the issue of the complete accounts showing there was a good surplus after payment of 3 per cent. dividend on the stock. The market is confidently anticipating that this stock will earn this year the full 5 per cent. to which it is entitled, and on the basis of 5 per cent. the yield at the current buying price is 6½ per cent.

This is a substantially higher return than can be obtained on a security of equivalent status in any of the markets of the Stock Exchange, and it is, therefore,

being anticipated that the stock will rise several points further in the course of the current year. The stocks of the Great Western and London Midland & Scottish retained steadiness on the issue of the statements, but London & North Eastern issues fell sharply on some disappointment with the dividend of 2 per cent. on the first preference stock. Although the dividend is double that paid on the stock for 1932, there had recently been estimates in circulation in the Stock Exchange that the payment would be 3 per cent. It is noticeable, however, that the fall of two points to 64 which occurred in the price of the first preference stock last Friday, when the dividend was declared, was largely recovered this week when a new Fortnightly account opened and the stock changed hands up to 65. The decision of the London Transport Passenger Board not to pay an interim dividend on the "C" stock for reasons clearly set out in the official statement caused a sharp

fall in the price of this stock. It is anticipated there will be a recovery, as there is recognised to be no actual change in the position in regard to earning prospects of the stock. In foreign railway issues there was little business. Antofagasta stock was strongly purchased at one time following an end-of-account fall, and wide fluctuations in price appear to be encouraged by shortage of stock.

Argentine railway stocks were quiet, with fractional declines. Central Argentine deferred stock is the only stock to show an improvement on the month's business. Leopoldina ordinary weakened further. San Paulo ordinary stock moved up at one time, but the jobbers were making a "wide" price. Mexican first preference was higher on balance. Nitrate Railway shares retained their recent improvement. Canadian Pacific shares, after a period of fluctuation, showed no change, the absence of dividend on the preference having no influence.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1933-34	Week Ending	Traffic for Week		No. of Week	Aggregate Traffic to Date			Shares or Stock	Prices						
			Total this year	Inc. or Dec. compared with 1933		Totals		Increase or Decrease		Highest 1933	Lowest 1933	Feb. 21, 1934	Yield (%)			
						This Year	Last Year									
South & Central America	Antofagasta (Chili) & Bolivia	830	18.2.34	10,250	+	£ 2,520	7	£ 80,250	£ 60,880	+	£ 19,370	Ord. Stk.	26	11½	21	Nil
	Argentine North Eastern	753	17.2.34	9,100	+	100	33	334,300	367,100	+	32,800	"	14½	5	9½	Nil
	Argentine Transandine	111	13.1.34	1,540	+	130	28	30,950	5,640	+	25,310	A. Deb.	35	40	50	8
	Bolivar	170	Jan., 1934	6,550	—	1,050	4	6,550	7,600	—	1,050	6 p.c. Db.	10	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	—	—	Bonds.	15	11	13	3½
	Buenos Ayres & Pacific	2,806	17.2.34	130,000	—	4,000	33	3,306,000	3,457,000	—	151,000	Ord. Stk.	26	97½	14	Nil
	Buenos Ayres Central	190	11.2.34	9,690	+	428	33	329,063	304,465	+	24,598	Mt. Db.	30	10	25½	Nil
	Buenos Ayres Gt. Southern	5,075	17.2.34	242,000	—	34,000	33	6,423,000	6,391,000	+	32,000	Ord. Stk.	44½	21½	31½	Nil
	Buenos Ayres Western	1,926	17.2.34	65,000	—	15,000	33	2,077,000	2,185,000	—	108,000	"	34½	15½	20	Nil
	Central Argentine	3,700	17.2.34	151,000	—	19,000	33	5,425,000	6,118,000	—	693,000	"	28½	15	20	Nil
	Do.	—	—	—	—	—	—	—	—	—	—	Div.	18	10	14½	Nil
	Cent. Uruguay of M. Video	273	17.2.34	14,994	+	268	33	537,219	505,617	+	31,602	Ord. Stk.	20	8	15	Nil
	Do. Eastern Extn.	311	17.2.34	3,101	+	65	33	105,485	107,273	—	1,788	"	—	—	—	—
	Do. Northern Extn.	185	17.2.34	1,993	+	142	33	57,554	62,973	—	5,419	"	—	—	—	—
	Do. Western Extn.	211	17.2.34	1,803	+	499	33	53,035	46,330	+	6,705	"	—	—	—	—
	Cordoba Central	1,218	17.2.34	29,000	—	5,000	33	1,397,000	1,401,000	—	4,000	Ord. Inc.	91½	2½	5½	Nil
	Costa Rica	188	Nov., 1933	18,534	+	3,195	21	99,724	107,788	—	8,964	Stk.	29	20	26	7½
	Dorada	70	Jan., 1934	11,700	+	3,900	4	11,700	7,800	+	3,900	1 Mt. Db.	76½	68½	80	7½
	Entre Rios	810	17.2.34	15,100	+	2,000	33	526,300	521,200	+	5,100	Ord. Stk.	26½	9	20	Nil
	Great Western of Brazil	1,082	17.2.34	9,900	—	5,000	7	78,700	118,100	—	39,400	Ord. Sh.	23½	12	5½	Nil
	International of Cl. Amer.	794	Year, 1933	—	—	—	52	\$1,537,681	\$5,013,065	—	\$475,384	"	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	—	—	1st Pref.	12	1½	1½	Nil
	La Guaira & Caracas	229½	Jan., 1934	4,400	—	2,710	4	4,400	7,110	—	2,710	Stk.	16	10	12½	Nil
	Leopoldina	1,918	17.2.34	20,795	—	6,087	7	149,649	173,864	—	24,215	Ord. Stk.	20½	10	12	Nil
Mexican	483	14.2.34	\$225,200	+	\$52,900	6	\$1,271,000	\$1,098,000	+	\$173,000	"	3	1	2½	Nil	
Midland of Uruguay	319	Jan., 1934	11,450	+	3,230	30	68,680	60,424	+	8,256	Ord. Stk.	2	1	2	Nil	
Nitrate	411	15.2.34	8,474	+	5,848	6	42,123	8,114	+	34,009	Ord. Sh.	78 6	11½	3½	Nil	
Paraguay Central	274	17.2.34	2,710	+	910	33	106,150	90,660	+	15,490	Pr. Li. Stk.	72	49½	69	8½	
Peruvian Corporation	1,059	Jan., 1934	58,729	+	8,881	30	388,420	396,121	—	7,701	Pref.	15¼	5	12	Nil	
Salvador	100	10.2.34	2,242	—	3,222	33	36,493	79,708	—	43,215	Pr. Li. Db.	70	66½	70	7½	
San Paulo	153½	11.2.34	31,736	—	10,611	6	171,655	187,315	—	15,660	Ord. Stk.	102	68	81	2½	
Taltal	164	Jan., 1934	8,135	+	30	30	39,200	15,525	+	23,675	Ord. Sh.	15¼	8½	15½	6½	
United of Havana	1,365	17.2.34	25,391	—	5,460	33	456,056	498,812	—	42,756	Ord. Stk.	8	2	5½	Nil	
Uruguay Northern	73	Jan., 1934	922	—	637	30	8,305	11,474	—	3,169	Deb. Stk.	6	3½	5	Nil	
Canada	Canadian National	23,750	14.2.34	549,569	+	86,360	6	3,394,286	2,854,900	+	539,386	Perp. Dbs.	60½	38	65	6½
	Canadian Northern	—	—	—	—	—	—	—	—	—	—	4 p.c.	—	—	—	—
	Grand Trunk	—	—	—	—	—	—	—	—	—	—	99½	85	98½	41½	
Canadian Pacific	17,018	14.2.34	419,000	+	76,800	6	2,644,000	2,232,800	+	411,200	Ord. Gar.	22½	11	17	Nil	
India	Assam Bengal	1,329	20.1.34	20,955	—	4,398	42	233,052	262,058	—	29,006	Ord. Stk.	79	70	73½	6½
	Barsi Light	202	27.1.34	3,382	+	397	43	124,590	115,110	+	9,480	Ord. Sh.	101½	70	98½	41½
	Bengal & North Western	2,113	27.1.34	36,112	—	17,312	17	788,694	775,210	+	13,484	Ord. Stk.	292	240	267	6
	Bengal Dooars & Extension	161	27.1.34	2,517	+	467	43	128,492	128,342	+	150	"	127	119	125	5½
	Bengal-Nagpur	3,269	20.1.34	105,225	—	4,533	42	4,402,622	4,073,631	+	328,991	"	97¼	83½	98½	41½
	Bombay, Baroda & C. India	3,089	10.2.34	194,700	+	20,325	45	6,690,600	6,499,425	+	191,175	"	112	107	110½	3½
	Madras & South'n Mahratta	3,230	27.1.34	112,425	+	6,388	43	4,599,467	4,443,135	+	156,332	"	127	114½	123½	7½
	Rohilkund & Kumaon	572	27.1.34	11,473	—	967	17	152,608	142,508	—	10,100	"	260	225	250	6
South India	2,526	20.1.34	68,335	—	4,045	42	3,278,165	3,329,408	—	51,242	"	119½	112	116½	6½	
Various	Beira-Umtali	204	Dec., 1933	49,418	+	13,362	12	149,024	116,708	+	32,316	—	—	—	—	—
	Bilbao River & Cantabrian	15	Dec., 1933	988	—	48	52	18,980	21,553	—	2,573	—	—	—	—	—
	Egyptian Delta	621	31.1.34	8,227	—	993	44	199,295	219,710	—	20,415	Pr. Sh.	151½	13½	2	Nil
	Great Southern of Spain	104	10.2.34	1,927	—	442	6	13,249	12,538	+	711	Inc. Deb.	4	3	5½	Nil
	Kenya & Uganda	1,625	Aug., 1933	159,746	+	12,456	35	1,523,550	1,273,216	+	250,334	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	—	—	B. Deb.	53	33½	43	6½
	Mashonaland	913	Dec., 1933	90,716	+	35,205	12	277,053	178,354	+	98,699	1 Mg. Db.	91½	42	93½	5½
	Midland o W. Australia	277	31.12.33	15,285	—	870	25	80,396	77,686	—	2,710	Inc. Deb.	89	70	95½	4½
	Nigerian	1,903	13.1.34	66,272	—	7,174	42	1,325,798	1,414,644	—	88,846	—	—	—	—	—
	Rhodesia	1,538	Dec., 1933	149,133	+	43,759	12	465,925	319,334	+	146,591	4 p.c. Db.	98½	80½	99½	4
	South African	13,151	27.1.34	490,665	+	70,981	44	19,558,117	16,922,445	+	2,635,672	—	—	—	—	—
	Victorian	6,172	Nov., 1933	778,567	—	11,734	21	3,576,106	3,675,303	—	199,197	—	—	—	—	—
Zafra & Huelva	112	Nov., 1933	10,926	+	149	47	123,826	120,955	+	2,871	—	—	—	—	—	

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1½.

† Receipts are calculated @ 1s. 6d. to the rupee. ‡ ex dividend.

§ Average rate of exchange for the week:—This year 325½, Last year 406½.

